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The Enos Coal Mining Company uses latest developments in equipment to meet present-day problems believing that . . .

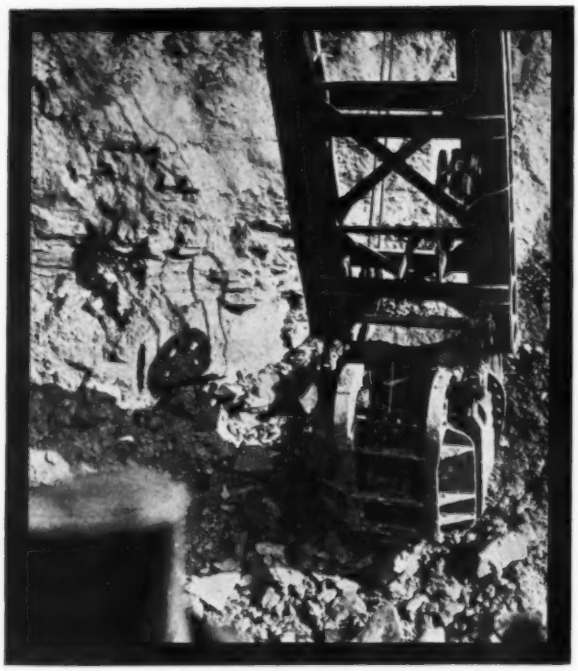
Giant 18-yard stripper . . . 404,140 cubic yards is typical of monthly output.

New Conditions Demand New Methods

THE STORY of The Enos Coal Mining Company is largely a story of the development of open pit coal mining equipment. General Superintendent W. H. Nichol says: "There has not been a year since I have been with Enos that we have not tried out one or more new types of equipment that have promised to cut our costs of production materially. Many of these new methods have fulfilled their promise, some have exceeded our expectations, all have involved developing new plans and reorganization of our efforts in order to take maximum advantage of the cost reductions they made possible. Lots of worry and work for all of us but it's been exceedingly interesting."

Enos coal is marketed throughout Indiana, Illinois, Iowa, Missouri, Wisconsin and Minnesota. High grade domestic and steam coal is produced in practically any size required. Sizes most in demand are ¾-inch, and 1½-inch screenings, ¾ x 1½-inch nut, 1½ x 2-inch nut, 3 x 2 nut, 6 x 3 egg and 6-inch lump. For the past year another size known as stoker screenings (⅜ x 1½ inch) has been marketed successfully. Then there is a crushed salvage

Vice-President and General Manager F. S. McConnell and General Superintendent W. H. Nichol beside the 12-yard dipper of the first of the present-day giant electric strippers.



Looking out from the operator's station on the 12-yard Bucyrus-Erie 750-B. Note the rock bank ahead of this machine.

coal of 1¼-inch screenings containing a somewhat high sulphur content but offering an economical fuel of satisfactory quality for industrial plants using a good draft.

General offices are located at 308 Euclid Avenue, Cleveland. Sales offices are maintained at the above address and in the Merchants Bank Building, Indianapolis; Straus Building, Chicago; also at Rockford, Illinois; Evansville and South Bend, Indiana.

Twenty-two Million Tons Good Coal in Reserve

The Enos property consist of about 3,000 acres all underlaid with a good grade of strip coal. So far only about 850 acres of this has been worked and the approximate proven reserve runs up to some 22,000,000 tons . . . probably about a 25 years supply.

To determine the coal tonnage in a tract of 3,000 acres requires extensive engineering. All the land is surveyed and mapped into sections. Each section is then drilled by "hand test drillers" and a log of each test hole is recorded. These holes are charted on the map of each section, showing the thickness of coal, amount and nature of overburden and the relation in elevation of one hole to another. With this information it is possible to plan the course of the strip shovels and estimate the production, months in advance.

Two pits are being operated at present, located quite close together and both branching off from the same main line cut. Stripping in Number 2 pit is handled by a Bucyrus-Erie 750-B 18-yard electric shovel with counterbalanced hoist, 85-foot boom and 66-foot sticks, behind which Bucyrus-Erie 50-B 2½-yard and Bucyrus-Erie 75-B 3½-yard electric shovels load out the coal. In Number 3 pit the stripper is a Bucyrus-Erie 750-B, 12-yard shovel with 95-foot boom and 60-foot sticks; first, by-the-way, of the present day giant stripping shovels.* This machine is followed by a Marion 36 1¾-yd. loader.

Here's the operator's comfortable room on one of the big strippers.

It is interesting to note that Enos has found it profitable to put in the storage yard three steam strippers in good working order... a Marion 300, Bucyrus-Erie 225 and a Bucyrus-Erie 175-B, also two steam loaders . . . a Marion 36 and Bucyrus-Erie 35-B. All of these machines are in good condition but use of the new types of equipment has shown that they cannot be operated successfully in competition with the more modern machines. All of these steam machines are offered for sale at bargain prices.

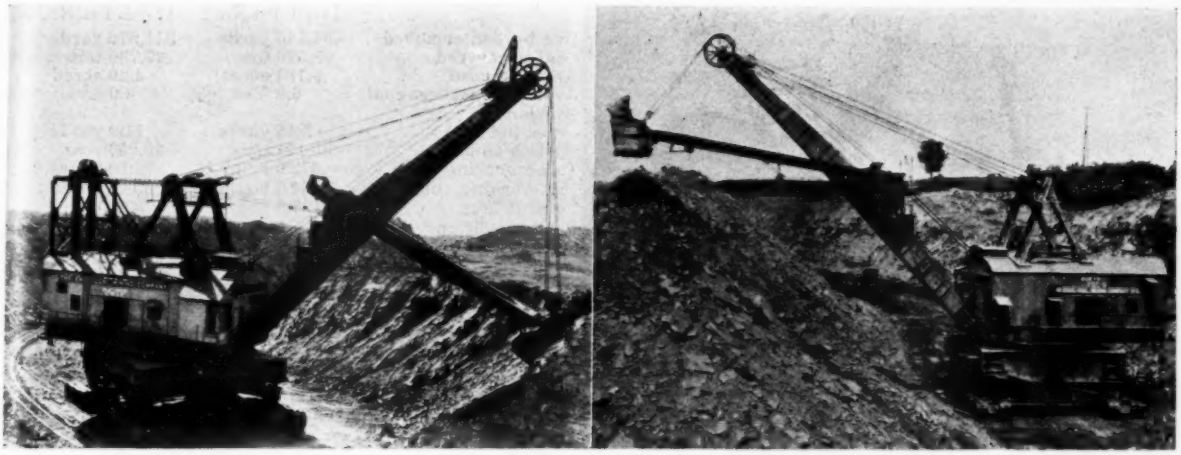
A Tough Job of Stripping

The 12-yard Bucyrus-Erie stripper was, at the time of our visit, operating in a 60-foot bank which contains 50 feet of rock. There is about ten feet of earth on top, then fifteen feet of sand shale, fifteen feet of sandstone, ten feet of gray shale, four feet of gray sandstone, one foot of gray shale, two feet of limestone and three feet of black slate. While this bank is typical of the worst of the stripping conditions at the plant of the Enos Company,

*EDITOR'S NOTE: In connection with the operation of this machine the following comments made by Vice President and General Manager Fred S. McConnell of The Enos Coal Mining Company before the New York meeting of the American Institute of Mining and Metallurgical Engineers in February, 1931 are of interest: "The first 12-yard shovel built, a 750 Bucyrus-Erie, was placed in operation at our plant in the early part of 1928, and in the year 1929, its first full year of operation, it handled 3,289,479 cubic yards; in 1930 it handled 3,354,993 cubic yards. A time study was made of this shovel's operation from February 21, 1929, to March 29, 1929, both inclusive. The operating schedule was three 8-hour shifts every day except Sundays. In this period the shovel handled 437,720 cubic yards. It made 40,640 cycles. It averaged 48 seconds per cycle. It carried 9.57 cubic yards per cycle. The average load of the bucket was 79.7 per cent of its capacity and it consumed 0.4 kw. per yard of dirt handled. [All figures are bank measure . . . banks worked carried a heavy percentage of rock.]

"When the shovel manufacturer designed this 12-yard shovel they built into its structural members a safety factor of strength that was never before built into a coal stripping shovel. This shovel operated from February, 1928, to November, 1930, without a shutdown for general repair. It was shut down in November, 1930, for a general overhauling of the electrical equipment and the driving of loose rivets. There was not a single structural member cracked or replaced, and the shut-down was for only six days. Our experience with the old 6-yard and 8-yard shovels was that every two or three years they had to be shut down for several weeks for a major repair and replacement job, the expense of which would run into many thousands of dollars . . . . .

"Two principles should govern the operation of a stripping shovel: (1) It should be so placed with reference to the bank to be dug that the available bail pull will produce the greatest digging effort; (2) it should be so placed with reference to the bank to be dug that the material can be spoiled with the least aggregate motion of the machine. Fortunately, these two principles work hand in hand. The position of the least stress and strain upon the machine, and that of the least effort on the part of the operator, is the position of the greatest digging and spoiling efficiency. A study of the operation of our 750 Bucyrus-Erie developed the fact that the stresses and strains, when the shovel was properly placed, were from 12 to 28 per cent, less than when the shovel was in the position in which it had frequently dug before the studies were made . . . . "



These two giant Bucyrus-Erie strippers at Enos have made excavating history. The one on the right was first of the present-day big strippers and was put into operation in February, 1928. It has a 95-foot boom, 60-foot sticks and 12-yard dipper. The machine at the left is one of the first carrying the revolutionary counter-balanced hoist and was put into operation at Enos in April, 1931. The boom is 85 feet in length, the sticks 56 feet. Because of the counter-balanced hoist it is able to carry an 18-cubic yard dipper with the same basic machinery and power unit as the earlier 12-yard, which, with an 85-foot boom, would carry a 16-yard dipper. For a description of the counter-balanced hoist see footnote on this page. Ward-Leonard control is used on both machines and they both carry General Electric equipment.

this stripper, during its four and one-half years of operation, has been digging in much worse than the average Enos conditions.

The bank ahead of the 18-yard machine was not so heavy and the digging was not so hard, although it too contained considerable rock.

Over Six Million Yards Overburden Stripped Last Year

During 1931 a grand total of 6,198,963 cubic yards of overburden were moved uncovering 910,-131 tons of coal of which 874,392 tons was loaded. The average overburden per ton of coal was 6.811 cubic yards. Approximately 132 acres were stripped. Operations at Enos are on the 6-day week basis, no Sundays being worked.

It is interesting to compare the output of the two strippers for this period.

The new 750-B 18-yard with counterbalanced hoist* was put into operation on April 21st, 1931. Its output for the balance of the year totaled 2,890,812 cubic yards. During the month of August neither stripper was operated so this figure represents output for approximately 7-1/3 months . . . 396,000 yards per month. Coal uncovered was 476,680 tons over an area of 69.719 acres, the average overburden per ton of coal running at 6.05 yards.

The 12-yard 750-B in Pit 3 operated the entire year with the exception of the month of August. In these 11 months it dug 2,767,511 cubic yards, an average of 251,592 cubic yards per month. Acres stripped totaled 47.914, coal uncovered 213,012 tons and yards overburden per ton of coal averaged 8.84.

In comparing the production of the two machines which shows from above monthly averages a 58%

This is the kind of every-day digging encountered by the Bucyrus-Erie 750-B 12-yard stripper.

*EDITOR'S NOTE: The Bucyrus-Erie counter-balanced hoist for stripping shovels, is one of the few definitely new features in shovel design to be introduced during the past five years.

This new hoist greatly increases the output of the stripping shovel by permitting increased dipper size and by increasing the operating speed of the shovel. Its essential parts are a movable counterweight with the necessary guides and tackle so arranged that, as the dipper goes up through the bank in its digging motion, the movable counterweight travels downward in its guides, counterbalancing practically all of the weight of the dipper and increasing the amount of digging force available. As the dipper is returned to the pit for the beginning of its next cycle, the counterweight is raised in its guides so that it is again ready to counter-balance the dipper on its way up through the bank. Thus, during the hoisting cycle practically all power of the hoist motors is spent in actual digging because the dipper's weight is counter-balanced by the descending counterweight.

Several important advantages are gained by the use of this hoist. Foremost among them are:

1. Increased digging power, both speed and digging force, without the use of larger electrical equipment.
2. Faster acceleration of the dipper in both digging and returning to the pit.
3. More accurate handling of the dipper—particularly when loading into cars.
4. Less heating of hoist motors and generators —lower average current and longer life.
5. Reduction of peak loads and consequent reduction in the current figure registered by demand meter.

The counterbalanced hoist makes possible the use of much larger dippers without any increase in the size of electrical equipment and without any appreciable increase in the total weight of the machine beyond increased weight of the dipper and dipper contents. The balanced hoist requires no increase in the total amount of counterweight; a weight equal to the movable counterweight would be found on an ordinary stripper as stationary counterweight.

The old goes out . . . the new moves in. The first Enos 750-B going in to replace old style steam stripper . . . 1928.

increase for the balanced-hoist machine, the digging must be considered. The depth of overburden for the 750-B carrying the 12-yard dipper for 1931 averaged about 40 feet, while the 750-B carrying the 18-yard dipper did its digging in a 35-foot bank. As to the kind of digging, the 12-yard machine had somewhat the worst of it, the bank in Pit 3 running about 60 percent rock, that in Pit 2 about 25 percent rock. However, even giving maximum consideration to all differences in conditions Enos officials consider the 18-yard short-boom machine good for about 33-1/3 percent greater output than the 12-yard long-boom machine under equal conditions with an identical expense for labor, a slight saving by the 18-yard in power cost, and a further saving in lower maintenance costs due to smoother operation.

18-Yard Shovel Moved 404,140 Yards in Typical Month

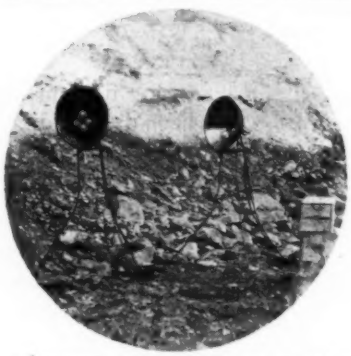
For a more detailed comparison let us take the mine reports on each machine for typical months. The 12-yard machine had a 48-foot bank of about 75 percent rock. The 18-yard had a 35-foot bank of about 50 percent rock. Here are the figures.

	18-yd. Pit No. 2	12-yd. Pit No. 3
Overburden removed	404,140 yards	311,970 yards
Coal uncovered	78,520 tons	27,730 tons
Area stripped	9.784 acres	4.20 acres
Average thickness coal	6.0 feet	4.0 feet
Overburden per ton coal	5.15 yards	11.3 yards
Coal to tipple	65,177 tons	30,250 tons
Total working time	672.0 hours	720.0 hours
Net working time	534.7 hours	656.4 hours
Total delays	137.3 hours	63.6 hours
Percent efficiency	79 percent	77 percent
Yards per gross hour	601 yards	433 yards
Yards per net hour	756 yards	476 yards
Mechanical trouble on shovel	62.5 hours	19.9 hours
Electrical trouble	1.0 hours	9.5 hours
Power used	118,740 K.W.H.	138,250 K.W.H.
Power used, per yard	.294 K.W.H.	.443 K.W.H.

High Praise for Liquid Oxygen

Liquid oxygen has been used for blasting at Enos since 1927. It has proved so successful that General Superintendent Nichol says "We couldn't live without it."

The plant, built according to plans and license from Air Reduction Company (Claude Method) of New York, consists of two units, one built in 1927, the second in 1928. The present capacity is 60,000 pounds of explosives per day.



Clustered lamps used for portable flood lights for night work.

The plant takes oxygen from the air, compresses it to a liquid. This liquid is combined with powdered carbon in cloth sacks which are used in very much the same way as cartridges of dynamite.

To produce the liquid oxygen air is sucked in through tanks in which a caustic soda solution is kept in circulation. The air is then raised to ap-

Action views of one of the new Sullivan drills. It took just 23 minutes by the author's watch to drill this 45-foot hole.

This liquid oxygen plant saves Enos many thousands of dollars per year in reduction of explosive costs. In addition, according to mine officials, this modern explosive provides greater safety, gives a greater shattering effect due to its rapid rate of detonation, makes a missed shot harmless within a few hours, saves springing of holes and permits shooting of wet holes.

proximately 1250 pounds pressure, and forced through a series of drying tubes which contain dry caustic soda, where oil and moisture are removed. This dry purified air is then expanded and liquefied forming liquid air, which is composed mainly of liquid oxygen and liquid nitrogen. The liquid nitrogen boils at a much lower temperature than does the liquid oxygen and due to this physical property the two liquids can be separated—the nitrogen being boiled off in gaseous form, where it is let out into the air, while the oxygen which is maintained in liquid form is discharged into suitable storage containers to be held until needed. The temperature of the liquid oxygen when discharged is approximately 332 degrees below zero Fahrenheit.

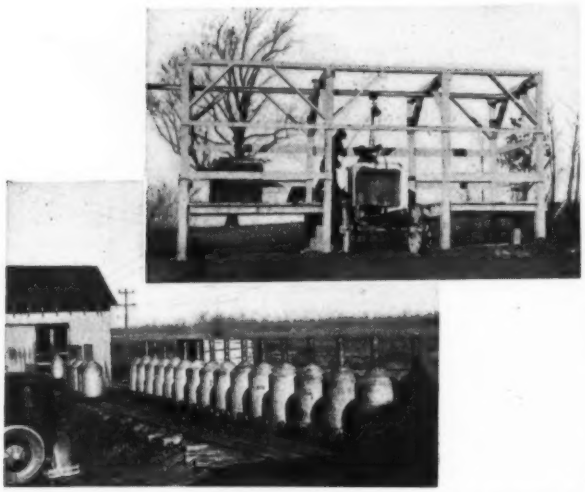
The liquid oxygen must be kept as cold as possible to prevent it returning by evaporation back into the air. It is therefore, discharged from the machine into Purox containers, huge vacuum bottles that hold 250 pounds each of liquid oxygen. These cans are mounted on wheels that run on a narrow gauge track and weigh 260 pounds when empty, 510 pounds full. When full the cans are pushed outside the plant to a short storage track where about 27 cans are kept ahead at all times. The plant operates three shifts, 24 hours a day, and the oxygen usually stands about 24 hours in the can before it is loaded into the cartridges. The oxygen does not lose any of its strength through standing though there is slight loss in volume. Cans have been kept at Enos in cool weather for as long as 32 days with only a six percent loss of volume. Note also that until combined with the carbon, the oxygen is in no way an explosive.

As needed the cans are taken into the charging house where the large refrigerating boxes, in which the explosive is transported to the pit, are filled. One of these boxes holds 66 cartridges. These are simply cloth sacks filled with powered carbon. They weigh 3¼ pounds dry, 12 to 13 pounds after being saturated with the liquid oxygen. Into each box goes from 750 to 800 pounds of liquid oxygen, (depending on how soon the explosive is to be used) and 66 dry sacks of carbon. The soaking process requires about 45 minutes and then the explosive (it is an explosive as soon as the carbon and oxygen

A blast from the new horizontal drill holes. Note the shattering action of the liquid oxygen concentrated in the heavy rock strata with sufficient heaving motion in the upper bank to give good breakage to rock strata there.

are combined) is ready for use. It may, however, be kept 10 to 12 hours in the box before loading without losing its efficiency.

About 3,800 pounds of this explosive is sold per day to neighboring mines. Occasionally orders are received for the liquid oxygen from hospitals for



Above: For the surface shooting the liquid oxygen is hauled by truck to transfer platforms where it is reloaded to wagons for delivery at the holes. Below: Purox containers containing liquid oxygen on storage track at the plant. As explosives are required the cans are shoved into the mixing house at the left where cartridges of carbon are soaked in the oxygen to form the explosive mixture.

medicinal use. In this connection we found that the Enos employees make a practice of going up to the oxygen plant and taking a whiff of the evaporating gas over the discharge pipe whenever they are troubled with colds or headaches. They claim it is an immediate and certain cure.

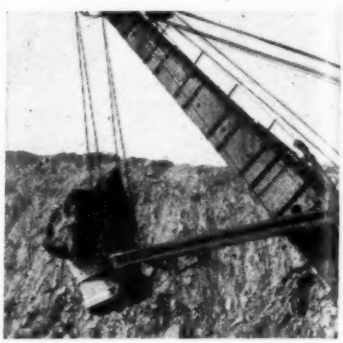
Cuts Cost of Explosives 50 Percent

Results at Enos have shown that, in efficiency, one cartridge of liquid oxygen compares approximately to one keg of black powder. Its cost is, however, less than half that of either black powder or dynamite. Owing to its low cost, especially considering that, with the plant established and operating anyway, additional output to capacity may be had with negligible expense, heavier charges are used than would be the practice with other types of explosives and better breakage and higher stripping output is obtained.

The following tabulation of a typical month's operations with liquid oxygen will be of interest.

	Pit No. 2	Pit No. 3	Total
No. L. O. bags used	2855	5590	8445
Holes shot	463	616	1079
Holes lost due to caving	17	21	38
Cubic yards of overburden broken	218,220	339,930	558,150
Cubic yards per bag of explosives	76.5	60.8	66.2

These figures are on the basis of the old drilling methods with vertical holes. Considerably increased efficiency will be shown with the new horizontal drilling.



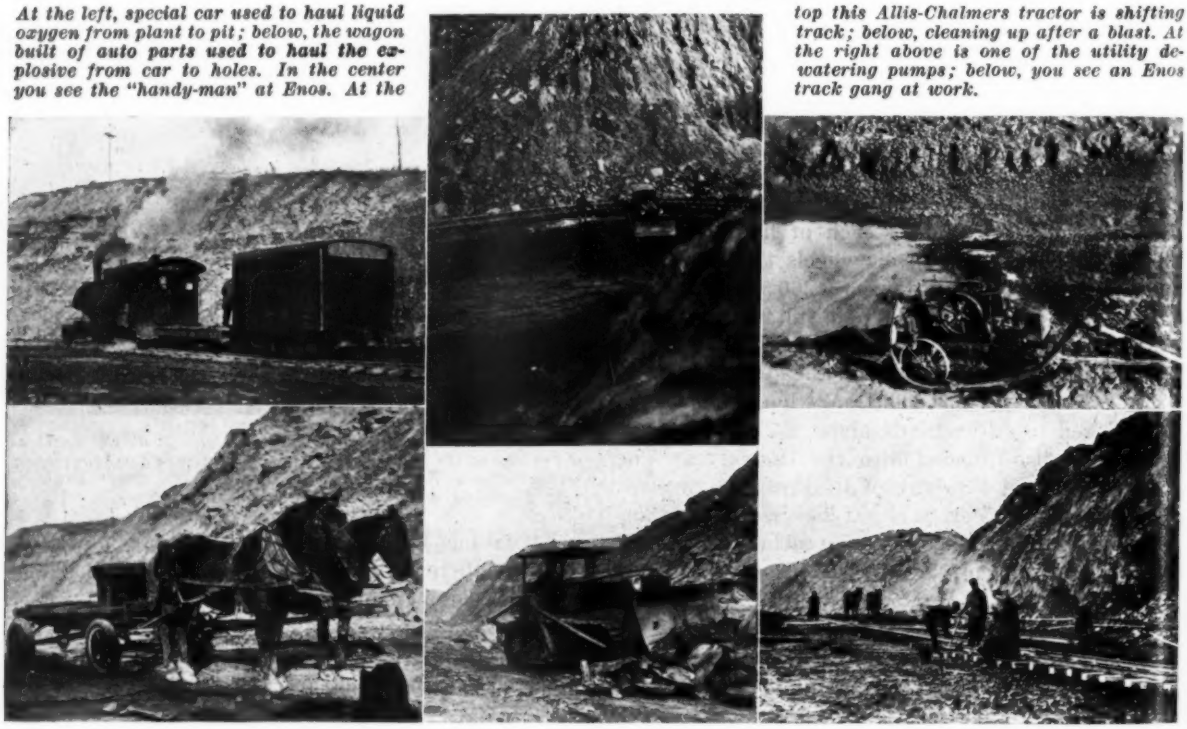
Notice how readily these big dippers carry oversize.

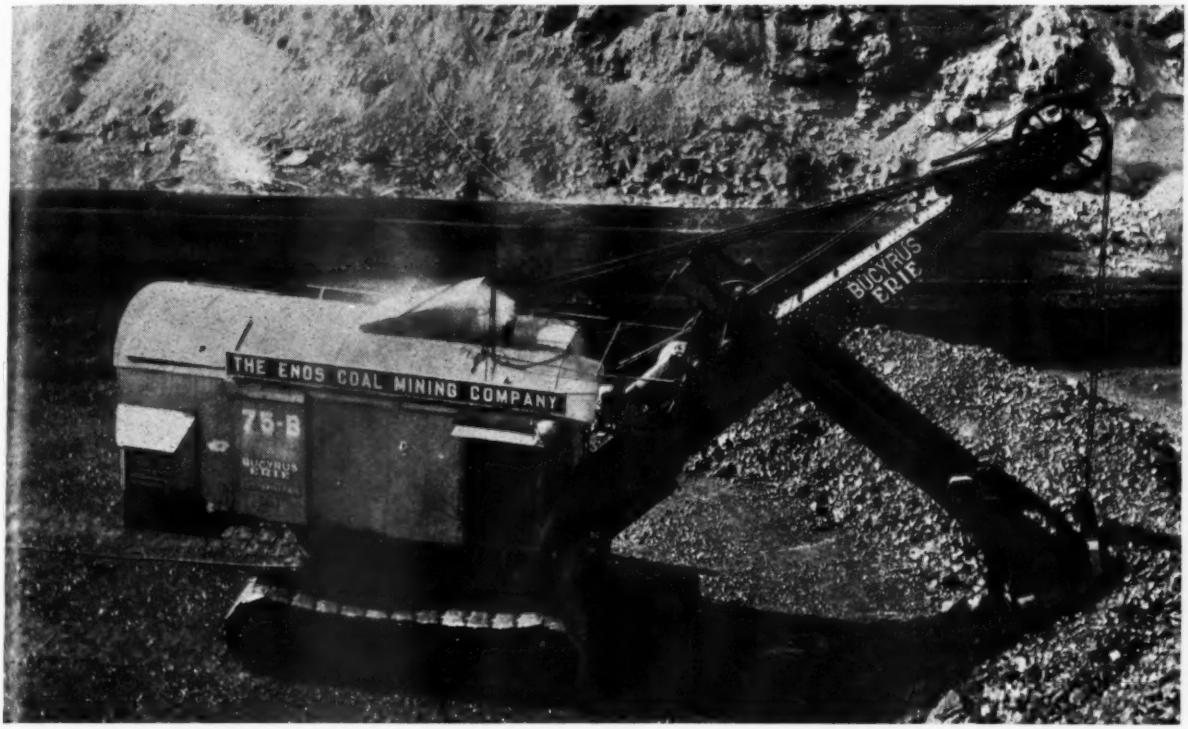
The liquid oxygen is fired with electric exploders in the usual way, Atlas Powder Company exploders being used. Coal is shot with Atlas pellet powder and 1¾x8 Atlas dynamite.

Machine Drills "Gopher Holes"

Formerly Enos drilled overburden with electric Loomis Clipper drills from the top of the bank.

At the left, special car used to haul liquid oxygen from plant to pit; below, the wagon built of auto parts used to haul the explosive from car to holes. In the center you see the "handy-man" at Enos. At the top this Allis-Chalmers tractor is shifting track; below, cleaning up after a blast. At the right above is one of the utility dewatering pumps; below, you see an Enos track gang at work.





Here's one of the Enos electric coal loaders waiting for the empties to be spotted in. In the winter time a small coal stove keeps the operator warm. Note the accurate cutting of the floor which insures clean coal with maximum recovery.

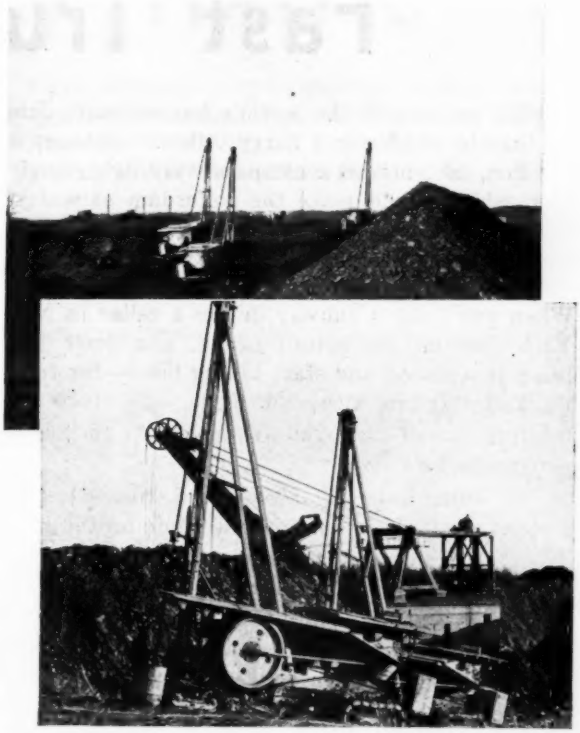
Although these machines have given excellent service they are being discarded in favor of a new method of drilling which promises a considerable saving.

The new horizontal method makes use of a new type of drill recently developed by the Sullivan Machinery Company of Chicago. The new Sullivan is mounted on crawlers and uses a 40 H.P. electric motor to turn an auger type bit which is extended by putting in 10-foot 10-inch sections as needed. The bit, formed with new superhard material called borium, rotates on the end of a heavy buss bar which is pressed forward by automatic hydraulic control and may be raised or lowered on its supporting frame to place the hole at any elevation desired.

At the time we visited Enos the first of the new Sullivans had only been in operation for a short time and two additional machines were just being unloaded. The new drill had, however, already earned enthusiastic praise from all concerned at Enos.

The horizontal holes (similar to the hand-driven gopher holes used on many mining operations) are bored in the one-foot seam of gray shale which lies five feet above the coal seam. The 5⅞-inch bit leaves a clean cut straight 6-inch hole. Holes are drilled 45 feet deep. On the afternoon of our visit the machine (on its fourth day of operation) was averaging holes the rate of 45 feet every hour and a half. We watched the drilling of one complete 45-foot hole in exactly 23 minutes. The drills cut fast and clean and with very little noticeable wear.

(Continued on Page 458)



Part of the fleet of sturdy Loomis Clippers which has given excellent service in the top-hole drilling.

Fast Trucking through

Earth Fill for World's Longest Cofferd Loaded, Hauled and Dumped by Ryan & Davis in Record Time

By Spencer A. Jones

THE pockets of the world's longest cofferdam had to be filled in a hurry. Allen N. Spooner & Son, Inc., needed a comparatively light, sandy loam which would make the cofferdam as watertight as possible, but earth in New York City, where the cofferdam was built for the Department of Docks, is as scarce as rock in an Iowa cornfield. When you build a subway or dig a cellar in New York City on Manhattan Island, you don't just bring in a shovel and start taking bites—far from it. You start in with rock drills, explosives and blasting mats — and your shovel loads rock, and not much else but.

The June issue of *Excavating Engineer* described the building of this cofferdam on the west side of Manhattan Island at the foot of West 48th, 50th and 52nd Streets, to enable the unwatering of more than 700,000 square feet of the bottom of the North River so that three great piers could be constructed, and the slips between them blasted and dredged to a depth of 46 feet below sea level. We told how the cofferdam pockets were filled, saying that "various excavations in all parts of the city contributed their share of earth", and that "each pocket held about 4,000 cubic yards of earth."

A Problem in Transportation

Ryan & Davis, of Jackson Heights, Long Island City, were in a position to furnish the necessary earth fill immediately, and by far the biggest share of the earth in the cofferdam pockets was loaded, hauled and dumped by this concern. It was easy enough to find plenty of earth in Long Island City, for there are still a few vacant lots there which need cutting down to street level. It was no trouble at all to load the trucks; Ryan & Davis own the first Bucyrus-Erie 43-B that came to New York, and they had it on the job. Trucks were plentiful; Ryan & Davis had twelve of their own Macks avail-

New York City Traffic

able, and had no difficulty locating twenty-five to fifty other Macks for subletting the rest of the hauling.

But what a haul! All the way across Long Island City, over two and sometimes three bridges, and across Manhattan Island through what is probably the densest traffic in the world. Nearly five and one-half miles from the shovel to the cofferdam! Almost bumper-to-bumper traffic practically all the way! Traffic lights every cross street for all but a few blocks! And no favors asked or expected from traffic police!

How Ryan & Davis Solved the Problem

After considering iron-clad routing and schedules, and trying to follow the routes and keep on time in their own private cars, John E. Davis, Edward J. Ryan and George A. Gaines, respectively President, Secretary-Treasurer and Chief Engineer for the Ryan & Davis outfit, decided upon a plan which worked because they know how to handle men.

Here is what they did: They decided to forget the rigid routing and the split-second schedules:

(Continued on page 456)

Looking northeast from Empire State Building toward Long Island City. "A" is where the earth was loaded on the trucks. "B" is the Queensboro Bridge which all trucks had to cross. The tall pointed tower immediately to the left of "B" is the Chrysler Building.

Cofferdams, sheeting and pumping on BRIDGE WORK

Contractors suggest methods of taking bids

In Excavating Engineer for July we published a discussion by highway departments of thirty-one states describing and commenting on their method of taking bids on the item of cofferdam, sheeting and pumping in connection with small bridge work. From the interesting letters received from various contractors on the subject we take pleasure in presenting the following representative comments:

Lump sum plus or minus in accordance with quantities

COST of cofferdams is not dependent upon yardage to be excavated due to the fact that for a given foundation size and depth the charge-off on material—steel or timber—cost of driving and pulling, pumping, and freight on material and construction machinery are fixed. Decreases in excavation quantities due to scour of the bottom or recalculation of volume warrant only a nominal decrease in payment as do increases within close limits. If increases are due to increased size or depth of cofferdams the increase in payment must be large enough to offset this.

If the contractor must bid cofferdams at a unit price for excavation he gambles not only with the physical hazard of the job but also with the hazard of variation in quantity which may be ruinous.

I believe the best method of bidding these foundations is on a lump sum basis for all cofferdam work including excavation as shown on the plans or as calculated, with a unit price for decreases and another unit price for increases in quantities.

B. S. CROOKS, V. P.
A. Guthrie & Co., Inc.
St. Paul, Minn.

Estimates on this type construction entirely too low

I HAVE always felt that some of the lump sum items on preliminary estimates put out by the State Department of Public Works were figured entirely too low. I have also heard this opinion expressed by many of my fellow contractors. I find this especially true in regard to the item of cofferdams, pumping, bailing, and draining, on bridge contracts.

I am sending you herewith a price analysis on this item as compiled from our experience on the construction of a four span truss bridge, four hundred and eighty feet long over the Allegany River at Red House, N. Y., County Highway 1854 constructed in the year 1930.

Cofferdam consists of 2640 Lineal Feet of Lackawanna Arch Web Steel Sheet Piling, 40.8 lbs. per foot, driven through 12 feet of gravel. A McKiernan-Terry No. 7 Double Acting Steam Hammer on a "Whirley" crane was used for driving and a No. 6 Hammer was used for pulling.

Actual Cost for 3 Cofferdams

Net cost of material after deducting resale value	$1818.17
Cost of driving	1502.80
Cost of pulling	684.40
Cost of pumping	1000.00
	$5005.37
20% Overhead, Emergency Fund and Profit	1001.07
	$6006.44
Depreciation on equipment, insurance, etc.	300.00
	$6306.44

$6306.44 ÷ 3 = $2102.15 average cost.

The Engineers estimate for this contract was $4500 covering cofferdams, pumping, bail and drain on three piers and two abutments. Note: that, although included in the estimate, the foregoing cost analysis does not include pumping on two abutments where no cofferdams were used.

This data has been compiled after a careful time study and I think it is very conservative. These cofferdams were constructed under the supervision of a man thoroughly familiar with submarine work, qualified by years of experience.

PETER J. KNICKENBERG
General Contractor
Buffalo, N. Y.

Prefers lump sum because of fixed charges

WHILE we have done very little bridge work in the past and have limited our activities almost entirely to industrial work, nevertheless we are called upon from time to time to bid on cofferdam work.

In a great many cases we are compelled to bid on the cubic yard basis or by the lineal foot of cofferdam. Believe you realize that the cost of cofferdams is dependent upon more vital work than the placing of the concrete. In other words, it is necessary to provide sheet piling, pile drivers, reinforcing steel, pumps, etc. which are bound to be a direct charge against the cofferdams regardless of the amount of concrete placed therein. A variation of concrete or lineal feet of length entails a risk that the contractor is unjustly asked to bear.

Our opinion is that the proper method of bidding on cofferdams is to bid a lump sum price for the cofferdam as designed which design should always be based on thorough surveys of conditions that will be encountered.

The method of estimating the cost of cofferdams is also much simplified if sufficient data is furnished the bidder and his price is to be a lump sum rather than on a unit basis.

H. G. ONSTAD, V. P.
James Stewart Corporation
Chicago, Illinois.

Old Timers!

Can you answer the questions on page 437?

FIELD NOTES

Dealing with Public Bodies

JUST as an excavation contractor puts up red lights to keep people from falling into holes he has excavated, he needs legal light to keep him from falling into legal pitfalls unconsciously dug by himself.

One of the most needful warnings to contractors doing work on public jobs, the cost of which is to be paid through special assessment of benefited property—as in the case of drains and sewers—is that the recoverable cost of construction cannot exceed the special funds available to pay the same.

An object lesson under this head appears in the case of Alden v. County of Todd, 167 N. W. 548, decided by the Minnesota Supreme Court. There a county ditch contract was awarded on an estimate that 51,968 cubic yards of earth must be removed. Later it was discovered that the estimate was short some 22,000 yards. Yet, the contractor proceeded, expecting to be paid an extra amount proportioned to the contract price, to cover the miscalculation of yardage.

The court decided that the contractor could not recover extra compensation, because that would exceed the amount assessed against the benefitd property. The county could not be held liable, because it merely acted for the drainage district.

When it was too late the contractor learned that he should have had capable local counsel help him make sure that he would have a right to extra compensation, before proceeding to take on the 22,000 extra yardage of excavation not covered by his contract.

—A. L. H. Street, Attorney-at-Law.

Neat Method of Holding Clock on Machine

A GREAT MANY little schemes are used to hold a small clock in some convenient place about the machine easily visible from the operator's seat. Due to the unavoidable vibration it is, of course, needful to hold it securely. Boxing it up like a caged lion is often done, but not necessary. A very simple and practical way is shown here. Part of an inexpensive spring curtain sash rod was cut off short enough so that when pulled up over the front of the clock it held the timepiece firmly. A coil was bent down where cut to take the small staple. The two were driven in at a slight angle. This neatly held the clock on a small strip of wood in the cab where it would have been impractical to make any kind of a shelf or bracket, yet plainly visible from nearly any part of the cab. These spring sash rods can be readily procured from any ten cent or novelty store for five cents. The clock is easily set in place, or removed for winding and adjustment.

—Frank W. Bentley, Jr.

Reinforced Concrete Lagging Used for Caisson in Place of Wood Lining

AN INNOVATION in the construction of foundations for skyscraper columns has been achieved in the second unit of the huge new Field building, now being erected at LaSalle and Adams streets, in the heart of Chicago's financial district, according to a press notice from the Marshall Field Estate, Chicago.

The process, invented by S. G. Martin, civil engineer, utilizes reinforced concrete lagging instead of familiar wood lining for the well or caisson. The cross-section of the concrete units resemble the letter "T", and are placed around the walls of the well as it is dug. They eventually become an integral part of the pier. The tops, or flanges, of these T's are placed against the earth. Tongues and grooves along their edges enable them to interlock longitudinally. The lower portions, or stems project inwardly and are of increasing width as they extend away from the flanges. This dovetail feature is for the purpose of locking them securely into the later-placed concrete of the pier proper.

The new process, Mr. Martin explained, provides a saving in excavation since the diameter of the well need be no larger than the specified diameter of the pier. When wood linings are used, the excavation has had to be larger to allow for the lining. Another advantage claimed is that less concrete need be put through the mixer on the job. Still another advantage is the saving effected in time and materials since the diameters of the wrought iron rings, used to hold the lining in place are shortened. The photographer shot straight down the caisson to get the above view. The caisson digger is about 20 feet down and the depth of this caisson is about 100 feet.

A patent application is now on file in Washington for Mr. Martin's process and its successful utilization in the Field building is expected to bring the innovation into common usage.

Rapid progress is being made on the second unit of this new structure, which is eventually to rise to a height of 42 stories and become Chicago's largest office building. Numerous innovations in building equipment, as well as new departures in construction, are included in the building. Graham, Anderson, Probst and White are the architects, the George A. Fuller Co., is general contractor, and the W. J. Newman Company is the sub-contractor on the caisson and foundation work.

A bachelor says that if he had to choose between two evils he would marry the one that had the most money.

She: "Do you think there is such a thing as a really good hair tonic?"

Barber: "Yeah. I know one or two that are all right if you add a little lemon juice."

THE EXCAVATING ENGINEER
FOUNDED 1905

A Monthly Publication Devoted to Excavating and Allied Subjects

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The Business Situation

THERE is more truth than perversity to the statement that the adjournment of Congress greatly improved business sentiment. The reason is a little less obvious than the fact.

There was considerable fear throughout the country that the last Congress might, in its endeavor to stimulate business, enact legislation, which, over a long period of years, would prove *detrimental* to business activity. For recovery, business needs a removal of barriers rather than artificial stimulation. Artificial stimulants are usually futile for the present and a hindrance in the future when repayment must be made of the money used.

Fundamental conditions are sound, although there are still several possible accomplishments which would help clear the way for improvement in business activity. For example, a general reduction of the present tariffs which have brought world-wide foreign trade to a virtual stand-still would enlarge markets and help business.

The month of August has seen a very definite improvement in business sentiment, a sentiment which has been reflected first, in bond prices and secondly in stock prices. The adjournment of Congress left us with a reorganized Reconstruction Finance Corporation with ample resources to prevent further bank failures, a condition partly responsible for change in sentiment already reflected by a slight dropping of the line showing the total money in circulation.

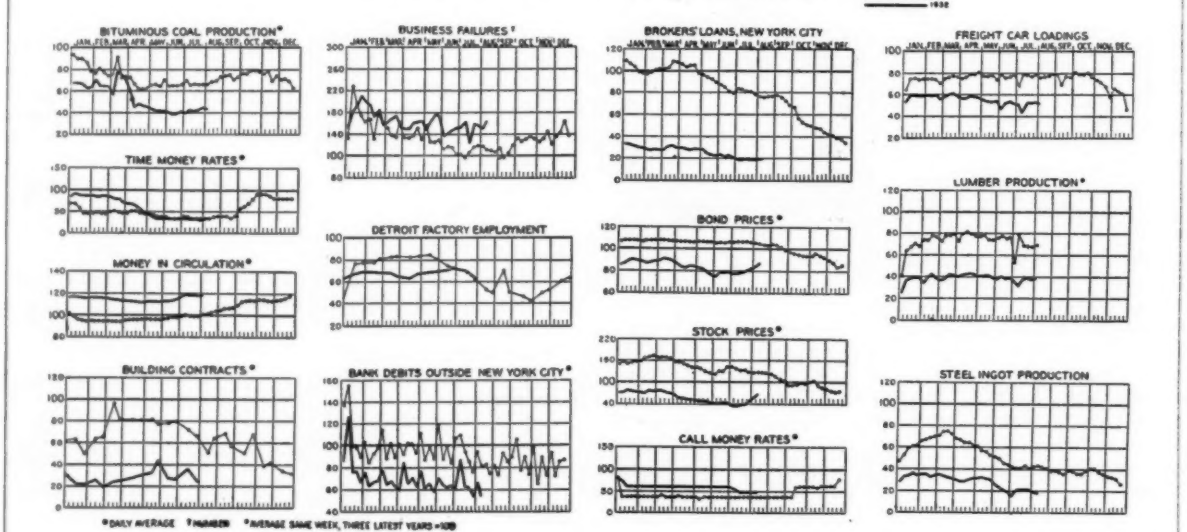
Construction showed an unseasonal upturn during the month of July, an increase which brought the total for the month well above the June total.

New construction contracts awarded in the thirty-seven states east of the Rocky Mountains during the period from August 1 through August 15 totaled $55,378,500, according to *F. W. Dodge Corporation.* This contrasts with $116,553,100 for the corresponding half-month of 1931. During all of July a total of $128,768,700 was reported for the thirty-seven states which compared with $113,075,000 for the entire month of June and $285,997,300 for July 1931. The advance over the previous month's contract total was produced by larger awards for non-residential building and public works; residential contracts and awards for public utilities showed declines from their respective June totals.

For the first seven months of the year contracts for all construction totaled $795,848,400; this was thirty-eight per cent as large as the contract record shown for the corresponding seven months of 1931. It is becoming apparent that the decline for the full year 1932 from 1931 will not be as drastic as that which has occurred during the first seven months; the full year should show a total between forty and forty-five per cent as large as the figure of $3,092,849,500 recorded for the full year, 1931.

Of the thirteen districts comprising the territory east of the Rocky Mountains eight report construction contract totals in July larger than those shown

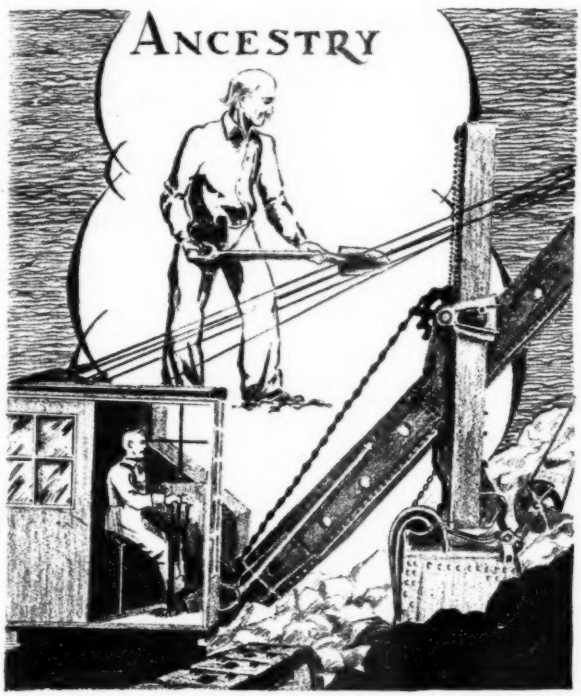
WEEKLY BUSINESS INDICATORS



for June: the Metropolitan New York; Middle Atlantic; Pittsburgh; the Central Northwest; Southern Michigan; St. Louis; Kansas City; and Texas districts. In addition gains were scored in July over July, 1931, in the Central Northwest and St. Louis territories.

Detroit factory employment has turned downward after its belated spring peak and at the end of July was very slightly above that of a year ago.

Business improvement and even prosperity can come about during a period of low prices but they will not start during a time of falling prices. Rising commodity prices have assured us that the law of supply and demand still works both ways.



By Clarence Edwin Flynn

When Pat came to this country
The shovel was the thing.
He got work on the section,
And, with a mighty swing,
He flung the dirt and gravel.
Saving the earnings won,
He built a little cottage,
And reared a blue-eyed son.

In due time Patrick's offspring
Followed his father's trade—
With up-to-date equipment,
The best and finest made.
Pat and his trusty shovel
Have passed, but he who will
May see both their descendants
Working together still.

OLD TIMERS!!!

Can You Answer These Questions?

Every now and then, Excavating Engineer is asked concerning some old timer, some old machine, or some old practice.

Here are some recent requests. Can you answer them? Can you supply the information asked?

Both the Questioners and Excavating Engineer will appreciate hearing from you. Published replies will be paid for.

Have you a picture of the old Cross Excavator — particularly the second machine that was built for Mathews as a back digger? Did you ever see it? Can you describe it? Where was it used?

Does anyone know where "Whiskey Bill" is? Many old timers will recall that crack operator of the old days in Illinois, who was known far and wide as "Whiskey Bill". It is rumored that he is dead. Do you know? What was his last address?

Have you a snap shot or photograph of one of the Old Rood machines? Do you remember the old double boom machines that worked in Illinois, Minnesota and Iowa in the 90's? Do you know of anyone now living who operated them?

Woman Successful in Excavating Field

MRS. Moynehan is the owner and manager of the A. Frederick Company of Johnstown, New York. The Frederick Company handles coal and fuel and also operates two sand and gravel plants. Their new Bucyrus-Erie 1020 shown here is going to be used for stripping and digging in the gravel pits.

Mrs. Almeda Moynchan beside her new Bucyrus-Erie 1020

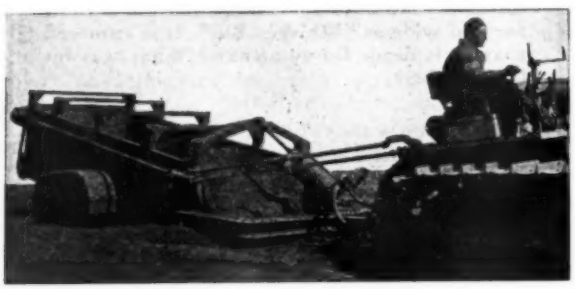
When we state that Mrs. Moynehan is the manager of the Frederick Company, we mean that she does that very thing in a way that would earn compliments for any man. Mrs. Moynehan has a very loyal organization, which is headed by Frank Waterman who acts as General Superintendent. Mrs. Moynehan's son, John, who, at the present time is interested mostly in motor boats and airplanes, says that one of these days he will take a serious interest in coal trucks and sand and gravel plants. John, who is now only 16, indicates that he has plenty of qualifications to some day manage the A. Frederick Company at Johnstown.

EQUIPMENT YOU OUGHT TO KNOW ABOUT

New Hydraulic Carrier

A HYDRAULIC CARRIER for handling 4 and 8-yard loads over distances up to 2,000 feet has been developed by the *American Tractor Equipment Co., Oakland, California.* This carrier is regularly mounted on crawler tracks, but for use under favorable conditions, the 4-yard carrier is furnished with large diameter, wide-faced wheels. The unit can be turned on the average road and is so balanced that it works under low pressure.

The carrier consists of a heavy, reinforced all-steel, electrically-welded body with an endless floor that operates like a conveyor. Power is transmitted from the tractor to operate the bed forward or



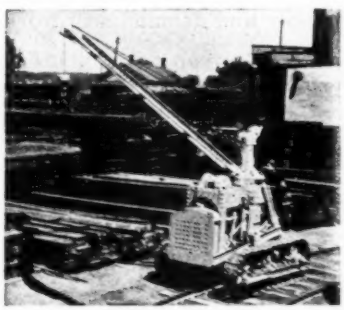
backward and the cutting edge of the carrier is raised or lowered by a hydraulic cylinder. The self-contained combination power unit, which also contains a ball-bearing pump, is operated by a single-lever-controlled clutch which operates for driving the bed. Power is delivered through a swivel-connected drive shaft.

In loading, the cutting edge is depressed by the hydraulic cylinder to the depth desired and as the tractor moves forward the dirt is rolled up into the bank. Under the tractor operator's control, by means of the endless travelling bed, this bank is gradually carried back into the body as more dirt is rolled up in front and the body is thus filled uniformly to full capacity. The digging blade is then raised and the body levelled by the hydraulic control and the tractor travels at high speed to deliver the load. This load is then spread to grade over the front or is discharged over the rear while the tractor is in high speed, or the rear of the carrier may be placed out over any slope and the load completely wasted with the unit standing stationary.

The carrier is one of the newest developments of its kind. It is sold through Ateco, Blaw-Knox and Caterpillar distributors. Readers in states west of the Rockies should address their inquiries to the American Tractor and Equipment Company, Oakland, California. If you are east of the Rockies write *Blaw-Knox Company, 2018 Farmers Bank Building, Pittsburgh, Pennsylvania* asking about the Blaw-Knox Ateco Carrier. An attractive booklet will be furnished containing complete specifications, illustrations and description.

Loadmaster Now Available With Caterpillar Power

THE NEW Model CT Loadmaster, powered by a Caterpillar engine and mounted on Caterpillar tracks, has been added to the Loadmaster line according to an announcement by *Bucyrus-Erie Company, South Milwaukee, Wis.* Other models are built with the McCormick - Deering or Case power and wheel mounting or trackson crawlers.



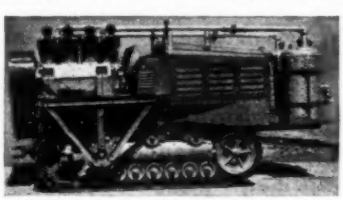
The Model CT Loadmaster is a compact crane of 4,500 lbs. lifting capacity. It fills the need for fast, mobile handling equipment which spots loads quickly. It has a full revolving boom. Besides lifting, swinging and carrying loads it can also be used for hauling trailers.

Standard booms are 10, 12 and 14 feet in length but longer booms are furnished when specified. Clearances are 9 feet 1½ inches, height, and 6 feet 1½ inches, width. Special equipment available includes magnet, bulldozer, winch, clamshell, etc. If you are interested in additional information write Dept. L30.

Compressor Mounted on Cletrac 80

AN IMPROVED method of mounting a heavy-duty air compressor on the model 80 Cletrac without in any way interfering with the drawbar work on the tractor, has been developed by the *Cleveland Tractor Company, Cleveland,* working with the *Davey Compressor Company of Kent, Ohio.* The tractor is standard, except for the specially designed mounting bracket and platform and the power takeoff.

Two four-cylinder Davey air-cooled compressors, with a combined displacement of 640 cubic feet per minute are mounted tandem. A 4-inch diameter heat-treated chrome nickel steel shaft 94½ inches long, extending through the tractor frame and fitting into the track frame at either side, serves to carry the dead weight of the compressors, and to relieve the tractor transmission case of strain caused by the superimposed load.



Compressors are largely of aluminum, and weigh but 725 pounds each. Vibration is practically eliminated by this type of construction and by the fact that compressor crankshafts are precisely counterweighted and have large bearing areas.

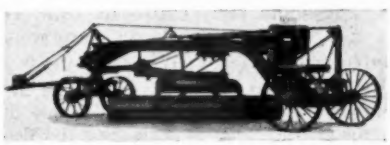
By putting the weight of the compressor over the tracks and near the seat, the equilibrium of

the machine is so well established that it will operate successfully at an angle of 40 degrees in any direction.

According to tests made, it is calculated that this new unit will operate the following tools at 640 feet: 10 cement breakers, 10 rotary jackhammers, 8 rotary rock drills, 16 clay diggers, 24 tie tampers, 14 riveting hammers, 10 timber saws, 10 pile drivers, or 42 paint sprays.

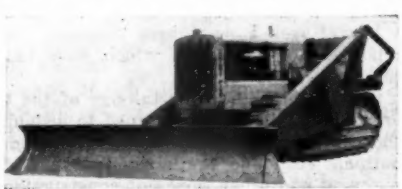
Power-Controlled Sixty Grader

THE power controlled "Sixty" Grader announced recently by *Caterpillar Tractor Company, Peoria, Illinois,* offers, according to the manufacturer, not just an easier job for the grader operator, but the constant control and quick responsiveness that facilitates adjustments, encourages the maintenance of just the right settings of all adjustments to insure doing the work in the best possible manner, all the time, toward the end of the day as well as at its start. The operator needs no rest periods—he is constantly alert to notice every needed adjustment for greater capacity, greater efficiency and more continuous operation. Turns are made quickly, easily. The result—better work for less money, less effort, less time — more miles of road for fewer dollars. Seven levers, in front of the operator, control the various adjustments. The power-control mechanism is of the same type as on the auto patrol—the control levers engage sliding jaw clutches to direct the power, transmitted thru the constantly operating gears, to the various points of action. Power to operate the power controls is provided by a single cylinder engine, 3⅝ in. bore, 4 in. stroke, 1300 R.P.M., air-cooled, developing approximately 5 horsepower, mounted on the grader. For complete specifications, write the manufacturer, mentioning *Excavating Engineer.*



LaPlant-Choate "Thirty-five" Roadbuilder

THE NEW hydraulic roadbuilder for use with the "Caterpillar" Thirty-five tractor, recently announced by *LaPlant-Choate Manufacturing Company, Inc., Cedar Rapids, Iowa,* possesses certain outstanding features to make it a particularly useful tool for use in building mountain roads, trails, fire-breaks or on any other job where it is necessary to cut into a side bank.



The blade is 9 feet 4 inches long and is completely oscillating with adjustments provided so that either end can be locked into any position desired. The blade will oscillate up or down at either end 16 inches. A sharp all steel removable cutting bit is provided at each end of the blade. The blade can be set at any angle for backfilling or sidehill cutting work or it can be set straight across for use in bulldozing work.

Other features of this roadbuilder include: extreme high lift of the blade above the ground level; newly designed main frame and jack which enables the blade to be forced into the ground; a double acting jack for forcing the blade into the ground, or raising it out, in the hardest going; design which leaves the tractor drawbar entirely clear; and reversible and removable cutting edge. For complete details and specifications write the manufacturer, mentioning this magazine, please.

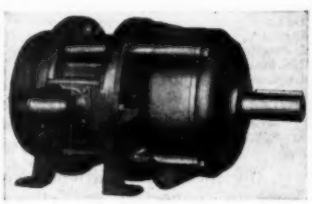
New Type Explosive Developed

A NEW type of explosive, to be known as Hi-Velocity Gelatin Dynamite, has recently been developed by *E. I. du Pont de Nemours & Company, Wilmington, Delaware,* according to a recent announcement made by that company. This is described as a straight gelatin that detonates at high velocity with a No. 6 cap, even when shot unconfined, and repeated tests are said to have proved that this material invariably reaches its high velocity within the first eight-inch cartridge.

These new gelatins will be offered only in the 60%, 70% and 80% straight gelatin grades, and in diameters not less than 2¾ inches. They are expected to be especially valuable in submarine blasting and in oil and gas well shooting. When writing for further information please mention *Excavating Engineer.*

General Electric Announces New Gear-Motors

A LINE of gear-motors, readily adaptable for application to machinery of widely various designs, has been announced by the *General Electric Company, Schenectady, New York.* The underlying principle of these gear-motors consists of a normal speed motor in combination with a built-in, internal-helical planetary-gear speed reducer. Since this type of construction permits a wide choice of speeds on the output shaft, it is possible to adapt a gear-motor to almost every type of low-speed drive. Compact construction, high efficiency, full horse-power rating of the motor at the output shaft, economy of installation and operation because of the self-contained unit, and simple design are some of the many features of these gear-motors, which are available in either flanged or vertical mountings.



The Company also offers gear-motors with special electrical characteristics, such as high starting torque with low starting current, normal starting torque with low starting current, adjustable, varying speed, multispeed, etc., or mechanical features such as totally enclosed; totally enclosed, fan-cooled; or Class I, Group D, construction for use in hazardous gas locations.

A-c., polyphase, squirrel cage and wound-rotor gear-motors are available in ratings up to 75 h.p., single phase to 5 h.p., and d-c. to 7½ h.p. D-c. gear motors are offered for those applications where either the advantages of adjustable-speed drive or a d-c. source of supply render their use desirable. Standard gear motors can be had with shaft speeds down to 13 rpm.

SHOTS FROM THE FIRING LINE

$136,000,000 for Emergency Highway Construction

IN THE two billion dollar Emergency Relief and Construction Act of 1932 which was signed by President Hoover on July 21st are a number of items of considerable interest to the excavating field.

The section authorizing $322,224,000 for public work carries $120,000,000 for state highways and $16,000,000 for National Park, Indian Reservation and public land roads. The $120,000,000 is mandatory and not discretionary with the President as is the rest of the public works section. Immediately available, it may be used either to match Federal Aid or "straight." But it must be used for work on the Federal Aid Highway System before July 1st, 1933. Any balance not used by this date will be withdrawn.

Allocation of this fund is as follows:

Alabama	$ 2,558,229	Nevada	$ 1,575,756
Arizona	1,760,771	New Hampshire	600,000
Arkansas	2,101,182	New Jersey	1,657,733
California	4,667,188	New Mexico	1,965,473
Colorado	2,258,613	New York	6,059,238
Connecticut	778,806	North Carolina	2,888,251
Delaware	600,000	North Dakota	1,933,901
Florida	1,624,752	Ohio	4,490,175
Georgia	3,123,298	Oklahoma	2,888,723
Idaho	1,505,912	Oregon	2,001,740
Illinois	5,082,847	Pennsylvania	5,267,060
Indiana	3,058,980	Rhode Island	600,000
Iowa	3,171,504	South Carolina	1,666,755
Kansas	3,265,048	South Dakota	2,004,573
Kentucky	2,264,637	Tennessee	2,605,160
Louisiana	1,745,559	Texas	7,664,621
Maine	1,067,079	Utah	1,395,331
Maryland	1,019,570	Vermont	600,000
Massachusetts	1,716,612	Virginia	2,256,178
Michigan	3,779,706	Washington	1,920,470
Minnesota	3,368,559	West Virginia	1,323,912
Mississippi	2,160,164	Wisconsin	2,991,076
Missouri	3,753,453	Wyoming	1,541,561
Montana	2,525,071	Hawaii	600,000
Nebraska	2,544,773		
			$120,000,000

In the special regulations issued by the Bureau of Public Roads in connection with the $120,000,000 road fund are provisions calling for selection of unskilled labor by contractors from lists of unemployed furnished by governmental agencies; preference for ex-service men with dependents; preference for local labor; limitation of hours to 30 hours in any one week (exception executive, administrative and supervisory positions); regulation of camp and commissary charges; furnishing certified copies of payrolls; minimum wage rates for skilled and unskilled labor; use of hand and team labor on such work as clearing, grubbing, finishing, trenching, light grading, etc., to provide maximum employment.

Included in the other items of the Public Works Section but dependent on available funds are: River and harbor projects, $30,000,000; flood control, $15,500,000; continuance of construction on the Hoover Dam, $10,000,000; air navigation facilities, $500,000; construction of light-house tenders and light vessels, $950,000; establishing and improving aids to navigation, $2,860,000; engineering work of the Coast and Geodetic Survey, $1,250,000; Bureau of Yards and Docks of the Navy Department, $10,000,000; emergency construction of public buildings outside the District of Columbia, $100,000,000; for the construction and installation at military posts of such buildings and utilities as may be necessary, $15,164,000.

Another feature of this Emergency Relief and Construction Act of particular interest authorized the Reconstruction Finance Corporation to lend approximately $1,500,000,000 to states, counties and cities for construction of projects which are self liquidating in character. Also the corporation is permitted to make loans for self liquidating projects: (a) "to corporations formed wholly for the purpose of providing housing for families of low income, or for reconstruction of slum areas"; (b) "to private corporations to aid in carrying out the construction, replacement, or improvement of bridges, tunnels, docks, viaducts, waterworks, canals, and markets devoted to public use"; (c) "to private limited-dividend corporations to aid in financing projects for the protection and development of forest and other renewable natural resources"; (d) "to aid in financing the construction of any publicly owned bridge to be used for railroad, railway and highway uses."

Another section provides $300,000,000 to be loaned to states for use in furnishing relief and work relief to needy and distressed people and in relieving the hardship resulting from unemployment. Future Federal Aid for highways is to be security for these loans and in case repayments are not made otherwise collection will be secured by deducting one fifth of the highway funds each year, starting with the fiscal year of 1935. Municipalities and other political subdivisions of the state may borrow direct from these R. F. C. funds by consent of the governor of the state. It is probable that a considerable amount of this fund will go into "work relief" in the form of street, highway, park, playground, and airport construction and other public works.

Associations Unite in 1933 Highway and Building Congress

THE HIGHWAY AND BUILDING CONGRESS, the largest and most significant gathering in the history of such enterprises, will be held in Detroit during the week of January 16-23, 1933. This was the decision of officials of ten national organizations, representing every phase of the mammoth highway and construction industry, who recently met to formulate plans. The Congress will bring together thousands of persons identified with highway and building construction activity. These will include Federal, State, County and Municipal officials as well as representatives of every branch of the industry. The combined experience and intelligence of the group will be devoted to determining the place of construction in the new economic era in which the nation finds itself.

The scale of the undertaking which the Congress is to launch is indicated in the list of participating organizations. They are: Construction League of the United States, American Road Builders' Association, Associated General Contractors of America, Motor Truck Executives Association, Asphalt Institute, National Crushed Stone Association, National Paving Brick Association, National Ready Mixed Concrete Association, National Sand and Gravel Association, and Portland Cement Association.

The program mapped by executives calls for concurrent meetings of the several individual organizations during the first three days of the Congress, to be followed by a joint session which will map a coordinated procedure for the entire industry and allied enterprises.

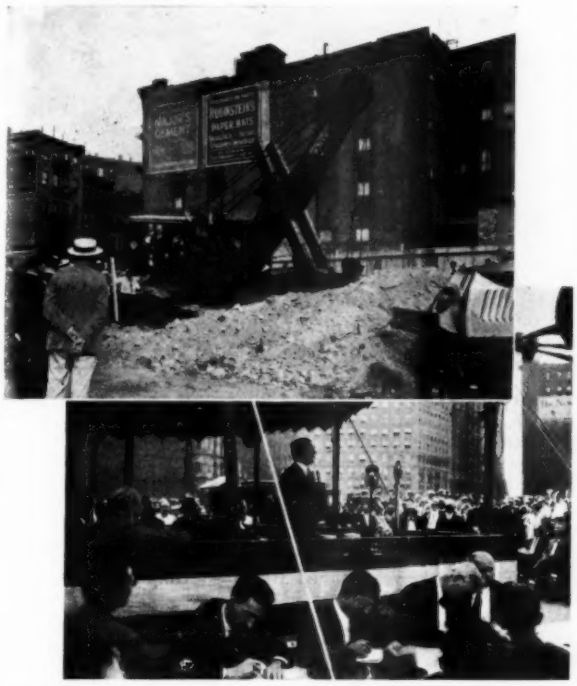
It will seek a permanent program which will prevent a repetition of conditions which have existed for the past three years.

One of the basic undertakings of the Congress will be a program of education designed to acquaint the public with the contribution of the construction industry to sustained national economic equilibrium. It will define the place of highway and other forms of construction in respect to improved transportation, industrial and agricultural production and distribution, education, communication, and all other phases of national life.

In the past, it has been the practice of the associations representing various phases of the construction industries to hold individual meetings in different cities and at different times. They have cooperated in many ways but their programs have lacked that degree of correlation which contributes most effectively not only to the industry's welfare but that of the public generally. The Highway and Building Congress promises a more valuable service to the industry and to the country as a whole.

Geo. J. Atwell Company Breaks Ground for 38-Story Federal Courthouse

By J. W. FAWCETT



GROUND BREAKING ceremonies for the new 38-story Federal Courthouse which will rise at Foley Square and Pearl Street, New York City are pictured in the above illustrations.

In the upper view Geo. J. Atwell, well-known contractor, whose company will excavate the site and build the foundations, is addressing the large audience. Beside him is Cass Gilbert, Jr. the architect. At the levers of the 43-B is Judge Martin T. Manton, Senior Judge of the U. S. Circuit Court of Appeals, ready to dig the ceremonial dipperful. Judge Manton commented, regarding the Bucyrus-Erie after doing his "shift" at the levers, "Wonderful in operation."

In the lower picture we see Mayor "Jimmy" Walker on the speaker's platform delivering an address in connection with the ceremonies.

The work is being capably and efficiently handled under the able and experienced management of Jack Davis and Ed Ryan.

Additional Flood Control

IT IS EXPECTED that an enormous amount of flood control works in the lower Mississippi Valley will be undertaken in the near future provided the U. S. Treasury certifies that it has available the $15,500,000 authorized for flood control in the Federal Relief Bill. Brig. Gen. Harley B. Ferguson, President of the Mississippi River Commission, has requested the entire amount authorized in the bill. It is reported that Maj. Gen. Lytle Brown, Chief of Engineers has indicated a probable apportionment of this special appropriation as follows: levee construction Memphis District, $6,500,000; Vicksburg District, $1,500,000; New Orleans District, $3,500,000; bank protection, construction work and dredging in all districts $4,000,000.

The $15,500,000 authorized in the Relief Act is in addition to the regular appropriation of $32,000,000 for flood control in the current fiscal year on which the present plans for lettings are set up.

Silas: "I didn't sleep very well last night."
Hiram: "What was the matter?"
Silas: "The shade was up."
Hiram: "Why didn't you pull it down?"
Silas: "I couldn't reach across the street."

Foreign

Chile

The Director of the Chilean Department of Roads has made a report which states that the **section of Inter-American (Pan American) Highway** in Chile between Santiago and the Peruvian border, a distance of approximately 1,577 miles, is **now open for travel.** Some parts of this, however, are not passable in certain seasons. It is also possible to cross the Andes during the summer months from Los Andes, Chile to Mendoze, Argentina, and thence to Buenos Aires.

Uruguay

According to the Ministry of Public Works, the Uruguayan Congress has approved the **road and bridge building and maintenance program** for the fiscal year 1932-1933. The budget provides for a total of 6,422,256 pesos. (The peso at par equals $1.0342 U. S. currency.) Under the program some of the more important expenditures are to be as follows: 2,217,838 pesos on roads and bridges already under construction; 913,069 pesos on roads and bridges planned, and to be planned; 2,337,396 pesos for maintenance of roads and bridges; and 353,951 pesos as the National Government's contribution to work undertaken and partly paid for by the various departments and municipalities.

Germany

Press reports indicate that negotiations are taking place for the organization of a consortium for financing **emergency work on German highways.** The leading institutions participating are the Reichs-Kredit-Gesellschaft and the Deutsche Bauund Bodenbank. When negotiations are concluded it is estimated that work will be provided for 25,000 unemployed.

Canadian Notes

Montreal and Vicinity

By S. A. STEPHENS, JR.

The recent opening of the Welland Ship Canal and the approaching completion of the Beauharnois Power Development, along with the recent signing of the St. Lawrence waterways Treaty between the United States and Canada, has buoyed up construction spirits in this locality. It is to be hoped that work will get under way shortly on this great undertaking.

Several sub-contracts have been let by the **Shell Oil Co. of Canada Ltd.** in connection with the construction of their $2,000,000.00 refinery and storage plant at Montreal East. **Marien-Wilson Ltd.** have been awarded contract for about 200,000 cu. yds. of excavation and have three B-2 "Bucyrus-Erie" shovels on the job.

Low bidder on the proposed waterworks duplication for Toronto is **Northern Const. Co. & J. W. Stewart Ltd.** at a figure of $1,055,083.26. The highest price submitted was $1,472,668.98. Work is to start immediately.

Kendall Bros., one of the largest excavating contractors in Eastern Canada, has started their subway contract under the C. P. R. tracks on Cote des Neiges Road. This is a unit of the City of Montreal's $4,800,000.00 relief program.

FREDERIC B. BROWN

It is with great regret that we record the accidental death, at his summer home, of Frederic B. Brown, M.Sc., well-known consulting engineer of Montreal. Mr. Brown was connected with many of the largest developments in Canada, the most recent being the Beauharnois Power Development, for which he was Consulting Engineer. Mr. Brown specialized in hydraulic and electrical engineering.

J. H. Alexander, well-known equipment man of Montreal, who is with the firm of Hopkins-Osborn Limited, is enjoying a prolonged holiday at North Hatley, Que. on Lake Massawippi.

Montreal Dual Mixed Concrete Limited, Montreal has been awarded a contract amounting to $204,309 for widening and raising 7½ miles of highway with asphalt concrete in Soulanges County. Work will be started at once.

The Provincial Department of Roads has just signed five contracts totaling $644,724 for **construction and mainte-**

nance of highways in various parts of the province. The largest of these was to **Macurban Asphalt Limited**, Montreal, for repairs in bituminous paving of the Granby-Magog Section of Highway No. 1, unit prices estimated to amount to approximately $590,309. The other four contracts were $6,000 or less.

On July 1st an important section of the **Trans-Canada Highway**, the Manitoba-West-Ontario link, was completed. This road gives access to the Lake of the Woods District and is expected to aid materially in the development of that section of mid-western Canada, and to stimulate tourist traffic from the United States.

Ontario

A highway between Hamilton and Peace Bridge at Fort Erie, to cost about $500,000 was started in July of this year. Fifteen miles will be of cement concrete and eleven of asphalt.

The Province of Ontario has awarded **contracts for road construction** in different sections of the Province amounting to approximately $1,165,000. The work is being done as a relief measure and the contractors are required to employ labor in the municipalities contributing towards the work.

New England Notes

By C. BRUCE McCOWN

Hughes Brothers, Bangor, Maine, were awarded a job in the town of Dexter, Maine. The job calls for 1.43 miles of reinforced concrete 20 ft. wide. Bid price was $35,780.10. Through error this job was reported in the last issue as awarded to Wyman & Simpson, Inc. of Augusta.

New York Notes

The New York Central has awarded to the **Walsh Construction Company, Syracuse**, a contract for the elimination of a grade crossing of its tracks with the Rainbow highway (Butts crossing) located 1.03 miles north of Gabriels station, Brighton, N. Y.; and to the **Hecker-Moon Company**, Cleveland, a contract for the elimination of a grade crossing on State highway No. 5334-A, south of Reading Center station, Reading, N. Y.

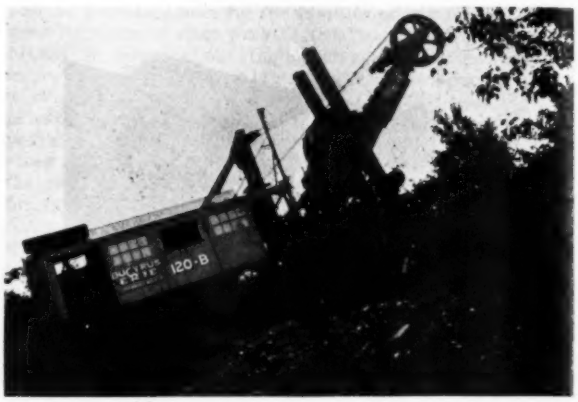
New Jersey Notes

On September 12th the **New Jersey State Highway Commission will receive bids** at Trenton on three emergency construction highway projects. One of these calls for 4.245 miles grading from Route 10, Section 4 State Highway Route No. 5 to Salem Street in Morris County. The work includes 335,000 cubic yards of earth excavation, 6,340 cu. yds. wet excavation, 48,000 cu. yds. rock excavation and 103,000 cu. yds. of borrow together with three small span bridges. Another calls for grading on Route 29, Section 12 of 4.791 miles between Centerville and Frelinghuysen Avenue in Somerset County. This involves 204,000 cu. yds. of earth and 25,000 cu. yds. of soft rock excavation. The third job is on Route 40, Section 7 between Browning Road and Kings Highway in Camden County. On this 3.49 miles there is estimated 90,000 cu. yds. of earth, 16,000 cu. yds of wet and 34,000 cu. yds. of borrow together with 101,917 sq. yds. of concrete pavement and 58,000 sq. yds. of gravel surface with two small span stream bridges. The special requirements of the emergency highway legislation apply with a minimum of 35c per hour for unskilled labor and 65c per hour for skilled labor. Hours of work are limited to not more than thirty hours in any one week.

The New Jersey Commission is also taking bids on September 12th for construction of a **bridge across the Ramapo Valley Road** and Ramapo River on Route 2, Section 9 in the County of Bergen. The bridge will consist of four spans having a total length of 230 feet, providing a 50 foot roadway with two sidewalks. The work involves 1,454 cubic yards of foundation excavation and 2929 cu. yds. of concrete with 624,000 pounds of structural steel and 136,000 pounds of reinforcing steel; also 5,800 lin. feet wooden foundation piling. This work is a part of the regular New Jersey program and special regulations of the emergency highway appropriation do not apply.

Pennsylvania Notes

By M. G. CONWAY



Moving in at the Tomoqua Colleries of the Lehigh Navigation & Coal Company this Bucyrus-Erie 120-B owned by **Hill and Suender** climbed 5000 feet of winding road with grades of 15 to 23 percent. As the road was narrow the 4-yard electric had to widen out as it went. The above picture shows the machine digging grade on the way up.

Joseph Herzog of Philadelphia has his Gas + Air and Type B shovels working on a contract in Wyoming-Luzerne Counties. This work was subbed from the **Union Paving Company** also of Philadelphia.

Wm. Eisenberg & Sons of Camden, were low bidders on 93,000 yards of excavation in Pike County at the Pennsylvania State Highway letting on August 5th.

H. R. Miller of Lancaster, is planning on putting his two Bucyrus-Erie Gas + Air shovels on the 34,000 yard of excavation on which he was low bidder at the Pennsylvania State Highway letting on August 5th. The job is located in Berks County.

Operator Louis J. Fitzello of Hazelton sends us this snapshot of **J. Robert Bazley's** Bucyrus-Erie 100-B which he operates. Mr. Fitzello usually operates the Bucyrus-Erie 320-B at this Cranberry strip coal operation but was temporarily handling the 120-B when this picture was taken. He speaks very highly of the keen management of Mr. Bazley, the team work of the organization and the excellent performance of the Bucyrus-Erie equipment in his letter. Oiler Mike Nichols is seen in the foreground.

Capitol Notes

By M. G. CONWAY

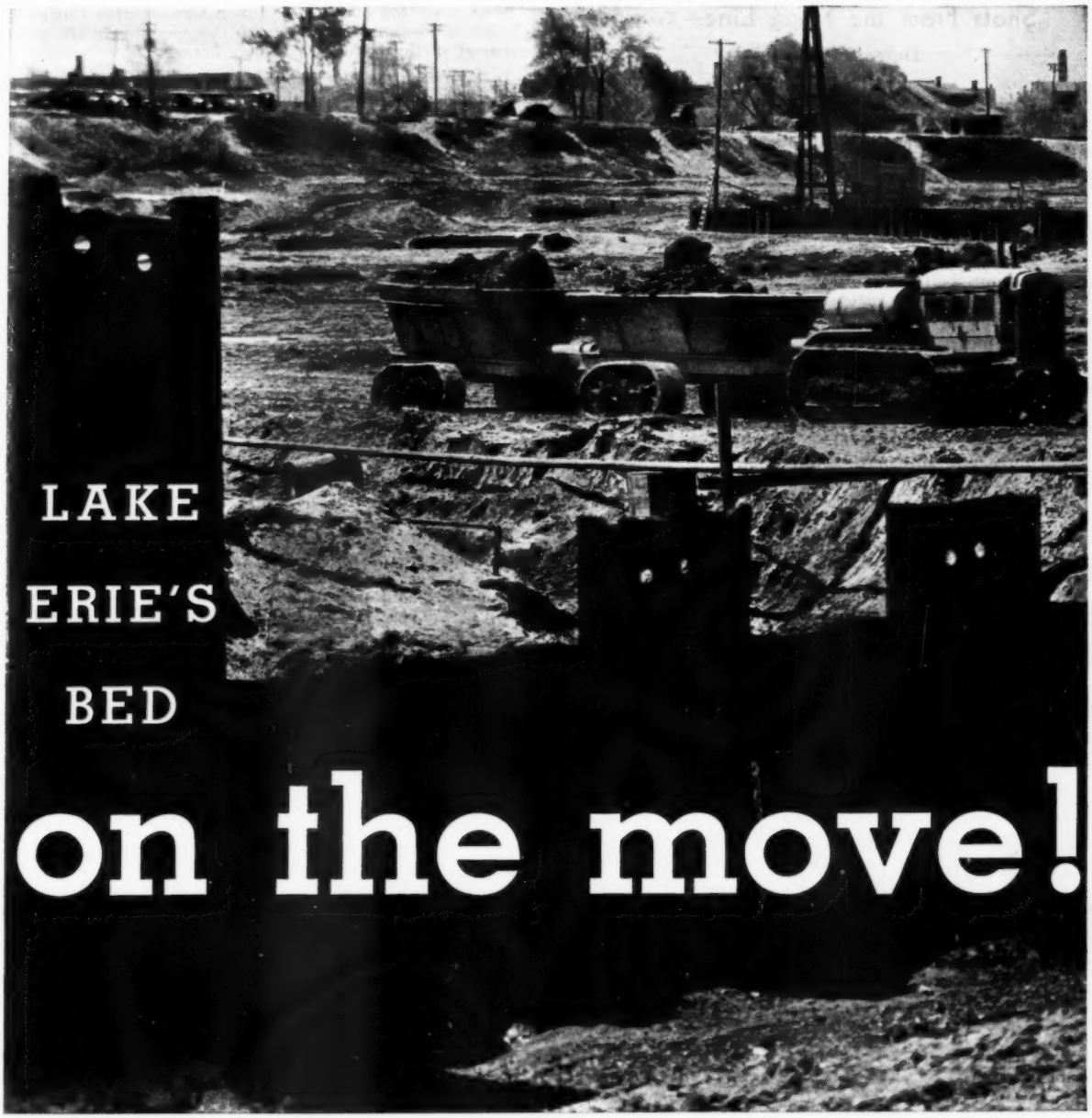
M. J. Dugan of Washington, has his Bucyrus-Erie Gas + Air in the excavation for the addition to the Post Office at Union Station.

The Earth Movers, Inc., of Hyattsville, Maryland, have their Bucyrus-Erie Gas + Air in the excavation for the extension to the Congressional Library.

Schlosser & Marino Brothers of Brooklyn are making fine headway in the 250,000 yards of excavation for the Extensible Building, Dept. of Agriculture.

P. T. McDermott Co., Inc. of Washington is low bidder on the excavation and fencing for the Central Heating Plant for the Treasury Department.

Old Timers!—See page 437



LAKE ERIE'S waters covered the site chosen for Cleveland's $15,000,000 Easterly Sewage Disposal Plant. From wading through fender-deep mud and water helping do the "lake-moving" work—to operating day and night to move 490,000 yards of dirt in double-quick time—"Caterpillar" Tractors cheerfully answered the contractor's call.

Today's closely-bid contracts demand proved tractor performance—proved traction, stamina and dependability. Watch the successful jobs—and count the "Caterpillars"!

Caterpillar Tractor Co., Peoria, Ill., U.S.A.
Track-type Tractors Road Machinery
Combines
(There's a "Caterpillar" Dealer Near You)

Prices—f. o. b. Peoria, Illinois

FIFTEEN	$1100	THIRTY-FIVE	$2400
TWENTY	$1450	FIFTY	$3675
TWENTY-FIVE	$1900	SIXTY-FIVE	$4350
DIESEL	$6500		

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TRACTOR

For your convenience in writing to Caterpillar Tractor Co. you will fi card bound in this issue.

Shots From the Firing Line— *Continued*

Detroit and Vicinity

By CLYDE B. DAVIS

Construction work on the **Livingston Channel widening** and deepening project, part of the Government's program of Great Lakes improvement in connection with the St. Lawrence Waterway, started July 25.

About 1,000 men will be employed, part of them living on a passenger boat. Eight scows and one dredge will be used in the coffer dam work. Four miles of dredging are to be done by the coffer dam system and two miles by the wet method, according to present plans. The company is establishing its base at Grosse Ile and starting work at the upper end of the channel.

The Arundel Corporation, Baltimore, holds the general contract for cutting the channel to 29 feet for passage of boats with 24-feet draft. Edward S. Johnson will direct the work of actually deepening the channel, which is to start about August 1. Col. Roscoe C. Crawford, War Department engineer, will supervise the work for the Government instead of Maj. David M. McCoach, Jr., who has been transferred to Vicksburg, Mississippi.

The Arundel firm has leased its equipment from the M. Sullivan Dredging Company of Detroit. The contract calls for work to be completed by May 1, 1936. **The Dunbar & Sullivan Dredging Company** of Detroit, which started work in July, holds the sub-contract for installing coffer dams.

Indiana Notes

Abel Brothers of Indianapolis were awarded paving of Michigan Street from East to Noble Streets in that city for $8,780 and from Noble Street to Pogue's Run bridge for $17,335.

Illinois Notes

Operator Buell Black of Jacksonville, who is handling a Bucyrus-Erie D-2 Diesel shovel for the **Krueger Construction Company** on their highway work on route 47 near Huntley, Illinois recently made a record that deserves mention in these columns. Krueger Construction Company on this job had, in one cut, a little over 12,000 yards of sand and red clay to move on a haul from 500 to 3500 feet. Loading to a mixed fleet of tractor drawn crawler wagons and trucks, Operator Black and the D-2 loaded out the 12,000 yards in just 100 hours, using a little less than $12.50 worth of fuel in the Atlas-Diesel engine. The average of a little over 120-yards per hour over a stretch of 100 hours is certainly an excellent performance and one of which any organization might be proud. The work is in charge of Superintendent Clark who is deserving of considerable credit for the record.

H. J. McCauley of St. Louis was awarded grading on Route 82 in Henry County on his bid of $58,718.

Bids of $20,727 and $24,988 brought **John Kenney & Sons, Inc.** of East St. Louis two jobs on Route 94 in Henderson County.

Ray Mann of Rockford took a paving job on 6 in Ogle County and Cameron-Joyce & Company of Keokuk, Iowa landed one on 78 in Fulton County.

With their bid of $12,175, **Union Construction Company** of Des Moines, was awarded the contract for 76,670 cubic yards of earthwork on the Illinois River.

L. A. Wilson and Company, Inc., of Ottawa were awarded the contract for 72,000 cubic yards of earth work at the Lockport Lock and removal of steel sheet piling and timber bracing at lock for $28,424 by U. S. Engineers.

The Dungey & Cochran Construction Company of Marion has forfeited their state contract for road construction in Bond County because of labor difficulties. A mob of 300 men would not permit the unloading of the company's equipment at Stubblefield to start this project. The State Highway Department has been advised by Attorney General Carlstrom that it can annul this contract and that Dungey & Cochran should be released from their proposal guarantee.

Illinois will get $5,082,847 of the $120,000,000 emergency federal appropriation for road work, according to word received from Secretary of Agriculture Hyde.

The State Highway Department opened bids July 27th totaling more than $500,000 for improving fifty-two miles of pavement and constructing a number of bridges and railroad overheads. The apparent low bidders are reported as follows: Senate Bill 203, Sec. 9-10, **Frank C. Feutz,** Paris, $19,652; Route 2, Sec. 4-Z, **Egyptian Contracting Co.,** Herrin, $18,649; Route 2, Sec. 9-Z, **Lund & Sager, Inc.,** St. Louis, Mo., $5,258; Route 13, Sec. 1-Z, **Lund & Sager, Inc.,** $37,720; Route 13, Sec. 29X, **Concrete Bridge & Paving Co.,** East St. Louis, $13,309; Route 13, Sec. 29Z, **Concrete Bridge & Paving Co.,** $79,609; Route 16, Sec. 14T, **Amos Culberson,** Raymond, $7,079; Route 23, Sec. 5-Z, **Illinois Valley Const. Co.,** Ottawa, $12,757; Route 37, Sec. 12-Z, **Egyptian Contracting Co.,** $2,760; Route 42A, Sec. A-Y, **E. A. Meyer Const. Co.,** Highland Park, $49,199; Route 42A, Sec. B-Y, **E. A. Meyer Const. Co.,** $115,378; Route 80, Sec. 103VA, **Brenz & Son,** Bloomington, $13,469; Route 82, Sec. 139, **Henkel Construction Co.,** Mason City, Iowa, $48,493; Route 95, Sec. 126B, **Des Moines Asphalt Paving Co.,** Des Moines, Iowa, $888; Route 120, Sec. 111-S, **Hartmann-Clark Bros. Co.,** Peoria, $3,421; Route 121, Sec. 134-S, **G. E. Hoffman Const. Co.,** Lincoln, $13,680; Route 127, Sec. 105-VX, **Hartmann-Clark Bros. Co.,** $7,884; Route 150, Sec. 111-X, **E. G. McKenna,** St. Louis, Mo., $10,073; Route 150, Sec. 112X, **E. G. McKenna,** $13,897; Route 150, Sec. 113X, **H. H. Hall Const. Co.,** East St. Louis, $5,894; Route 160, Sec. 132X, **Tri-City Paving & Const. Co.,** Granite City, $5,777; Route 160, Sec. 133-VX, **Tri-City Paving & Construction Co.,** $15,989; Route 160, Sec. 134-VX, **Tri-City Paving & Const. Co.,** $10,393; Route 160, Sec. 135-VX, **Tri-City Paving & Const. Co.,** $10,196.

Luety Brothers of Beloit, Wisconsin, were awarded contract for approaches to river bridge on South Main and Spring streets at Galena for $15,928.87. The state is cooperating on this improvement.

Kentucky Notes

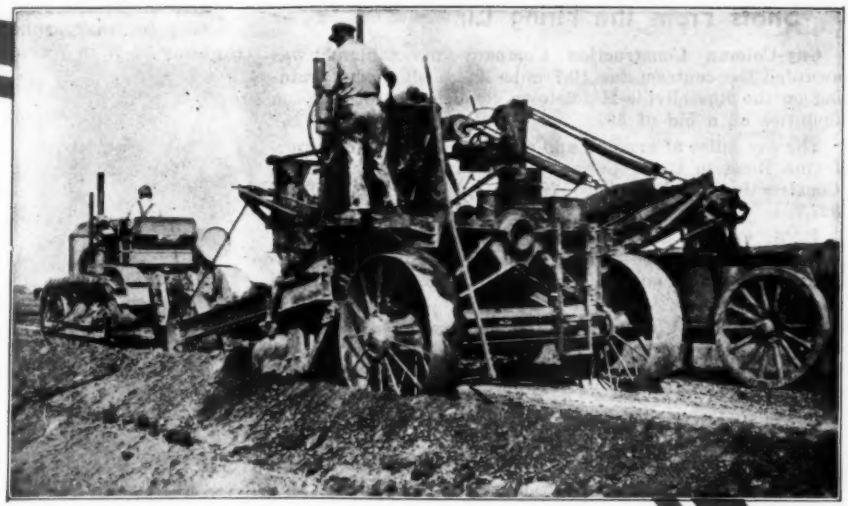
By W. E. CHAMBERS

Hardaway Construction Company of Columbus, Georgia, with a bid of $126,961, was awarded the contract for grading, draining and surfacing 6.9 miles of the Carrollton-Ghent Road in Carroll County.

Louis des Cognets Company of Lexington, with a bid of $40,528, was awarded the contract for grading and draining 7.2 miles on the Crestwood-Ballardsville Road in Oldham County.

With their bid of $37,456, **J. W. Cain and Company** of Louisa were awarded the contract for grading and draining 4.8 miles of the Louisa-Sandy Hook Road in Lawrence County.

The Bristol Steel and Iron Works Company of Bristol, Virginia was awarded the contract for grading and draining the 1.9 miles on the Roxanna-Elsiecole Road in Letcher County on a bid of $19,002. Also contract for a superstructure bridge at Roxanna on a bid of $6,252.



Never Has Weakness Developed In The Frame of The No. 6

Gruelling service of several seasons has never yet developed a weakness in the frame of the Western No. 6 elevating grader. Great strength without excessive weight has been accomplished by its revolutionary design. The members are relatively light but metal is massed where needed. A 10-inch torsion tube of steel gives the machine an UNBENDABLE backbone.

The No. 6 is absolutely new throughout. Rugged construction; a stiff leg that forces the plow into the ground; a one-piece rigid elevator; 3-point suspension; a motor-driven belt and automatic belt tension control, combine to give enormous and trouble-free production.

Bulletin W-31-CK describes in detail the construction features that enable the Western No. 6 to produce a big yardage at low cost. Where shall we send your copy?

WESTERN WHEELED SCRAPER COMPANY

DUMP CARS AND GRADING EQUIPMENT

AURORA, ILLINOIS, U. S. A.

● Note the tubular frame; 3-point suspension; the one-piece carrier; the stiff leg plow control; the motor driven belt.

WESTERN

For your convenience in writing to Western Wheeled Scraper Company you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

Gay-Colman Construction Company of Ashland was awarded the contract for 10.7 miles of grading and draining on the Russellville-Middletown Road in Logan-Simpson Counties on a bid of $69,819.

The five miles of grading and draining on the Winchester-Irvine Road in Clark County was awarded to the **Codell Construction Company** of Winchester with their bid of $27,724.

E. A. Chilton and Company of London with their bid of $48,582 were awarded the contract for grading and draining the 4.7 miles on the Winchester-Irvine Road in Estill County.

H. H. Miller Construction Company was awarded the contract for grading and draining the 1.5 miles on the Chavies-Buckhorn Road in Perry County. Bid price, $23,316.

Lewis and Kelly of Harlan, with their bid of $56,000, were awarded the contract for grading and draining the 10.2 miles on the Somerset-London Road in Pulaski County.

Southeastern Construction Company of Eminence was awarded the contract for grading and draining 3.8 miles on the Cropper-New Castle Road in Shelby County. Amount of the bid was $16,458.

Carter and Braden of Clay, on their bid of $20,487, were awarded the contract for grading and draining 7.5 miles on the United States Highway No. 41 in Henderson County. **Gorrell, Barrow and Kirkpatrick** of Owensboro were awarded the contract for concrete surfacing. Bid price, $79,543.

Ellis, Kelley and Company of Owensboro bid $17,643 for drainage only on the five miles on the Hawesville-Fordsville Road in Henderson County; bids for grading and draining rejected and $15,000 set up for grading by force account.

Corum Brothers of Madisonville were awarded the contract for grading and draining 5.8 miles on the Calhoun-Livermore Road in McLean County on bid of $43,357.

INTEREST PAYABLE — The use of a Hayward Bucket pays interest regularly in the form of lower excavating costs. Address The Hayward Co., 52-54 Church St., New York, N. Y.
Hayward Buckets

Campbell Brothers of Bowling Green were awarded the contract for rock asphalt surfacing of the United States Highway 31-W in Warren County. Bid amounted to $83,682.

Wisconsin Notes

By CARL J. BACHMANN

Anderson and Company of Chicago find many uses for the above Bucyrus-Erie B-2 steam crane which they are using to build storm sewers for the Milwaukee Sewerage Commission along the Milwaukee River in Lincoln Park, Milwaukee. Equipped as a clamshell excavator it handles the excavation of the sewers. Converted into a bucket crane it hauls out muck. With a McKiernan-Terry pile hammer it drives sheet piling for which work it has also been equipped with a special large boiler. In the picture fireman Fred Cappaert and operator Grant Schuldt are shown standing beside the machine. This storm sewer work is being done to prevent floods along the upper Milwaukee River in the spring when the snow melts and the rains are heavy. At the time the picture was taken the machine was idle due to the large amount of water at the bottom of the shaft which hampered the sheet piling and Mr. Schuldt was waiting for the pump to lower the water level before resuming the pile driving operation.

Nebraska Notes

By CHARLES P. RODMAN

Hall and Young, road contractors of Curtis, Nebraska lost all equipment in a fire July 19th. This company had $75,000 of machinery in storage in a large shed near Curtis. Origin of fire unknown but supposed to have been the result of hobo carelessness. Insurance carried in the amount of $20,000.

State Engineer Roy Cochran has begun the distribution of 1932 contracts that will cost in the neighborhood of $1,700,000. Fifty-one projects will be let at once. This means 325 miles of road construction in Nebraska this season, including 40 miles of paving. The State Engineer insists on several new ideas in letting this work. He requires bidders shall employ local labor so far as possible, use Nebraska products, limit the working day to ten hours, establish a minimum hourly wage of thirty cents, and higher in certain localities.

The Yant Construction Company of Omaha has been awarded contracts to the amount of $783,616. This includes 26 miles of paving between Columbus and Clarks.

Western Bridge Company also contracted to the amount of $77,569 receiving one award for the construction of ten miles of oil-sand paving near Atkinson.

It has been announced that work will begin on the **new Omaha Government building** within thirty days. This is a six story building to cost $600,000. Excavating in connection will comprise about 5,000 cubic yards.

"Let me kiss those tears away," he begged tenderly.

She fell into his arms and he was busy for the next few minutes. And yet the tears flowed on.

"Can nothing stop them?" he asked breathlessly.

"No," she murmured, "it is hay fever, you know. But go on with the treatment."

Old Timers!—See page 437

For your convenience in writing to The Hayward Co. you will find a card bound in this issue.

BALANCE

This illustration is made from an actual photograph of Tru-Lay Preformed Wire Rope. Only in Preformed Wire Rope will the strands and wires stay in position without seizing or tying the end as this photograph reveals.

"High-stranding" and "low-stranding," are wire rope faults well familiar to men who pay the bills for wire rope. Equal strand loads, as obtained in Tru-Lay Preformed Wire Rope, is an important advantage.

PERFECT BALANCE OF TENSION NECESSARY TO INSURE EQUAL LOADING OF STRANDS

A high strand (underloaded) is quickly crushed and destroyed. A low strand (overloaded) soon parts, leading also to rapid wire rope destruction.

In Tru-Lay, strands and wires are preformed to the exact shape they assume in the finished rope structure. They lie naturally in position—inherently adjusted to each other, so when the rope is put to work each strand carries an equal share of the load. Resistance to high and low-stranding is one of the many cardinal reasons why Tru-Lay Preformed Wire Rope wears so much longer.

There is no straightening out tendency in Tru-Lay—no internal stress. This results in less fatiguing action, longer life, easier handling, greater flexibility, just to mention a few of the advantages of TRU-LAY Preformed Wire Rope.

Tru-Lay is furnished in every grade and construction, and gives much longer service over *non*-preformed wire rope of the same grade and construction. Get all the facts.

Write on your business letterhead for your copy of this interesting booklet. It tells, in a non-technical manner, facts about Tru-Lay Preformed Wire Rope that every wire rope buyer should know.

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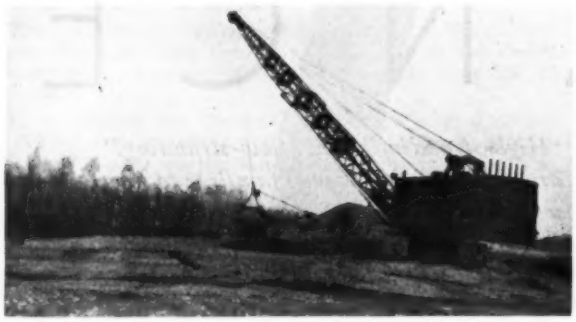
TRU-LAY *Preformed* WIRE ROPE
Made in all sizes, lays, grades and constructions

For your convenience in writing to American Cable Company, Inc., you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

St. Louis and Vicinity

By B. R. ANDRES



Union Construction Company, Des Moines, recently finished up an interesting levee job on the Illinois River about two miles south of Beardstown, Illinois. They pumped in the base of the new levee with a 15-inch hydraulic dredge, then topped with a 52-B Bucyrus-Erie Diesel dragline using material from the old levee.

The material pumped in was nearly all sand, taken from the main channel of the Illinois River, about one thousand feet from this levee. The old levee was mostly all common dirt and clay, and this was used to form the core of the new levee, and topped out with sand. The system made a very nice looking levee with an almost perfect grade when completed.

Operators Heithecker, Waddell and Chappell worked the 52-B three eight hour shifts. The machine has a 70-foot boom, 1¾-yard bucket and Atlas Diesel engine. It handled very nicely with this combination, and fitted the job splendidly. D. E. Thomas is general manager of Union Construction Company and was superintendent on this job. E. G. Fingar was assistant to Mr. Thomas.

W. W. Roth of Monticello, Indiana was awarded the contract for 444,000 cubic yards of earthwork on the Valley City Drainage and Levee District in Pike County on a bid of $56,832.

With their bid of $35,070 **Billhorn, Bower and Peters** of St. Louis took the contract for 334,000 cubic yards of earthwork on the levee for the Valley City Drainage and Levee District in Pike County.

By H. E. SNIPE

You would hardly guess it unless you study the foreground carefully but this is not a real life size shovel. It's a model made by **G. H. Harden** of Little Rock, Arkansas. Mr. Harden spent about six months of his spare time building it. It is an exact duplicate of the Bucyrus-Erie GA-3. An idea of size may be arrived at by comparison with the desk furniture shown in the picture. The machine is setting on a small desk letter file.

First Collegian: "Jiggers, here comes a speed cop."

Second Ditto: "Quick, hang out the Notre Dame pennant."

BIG SAVINGS

have small beginnings

THESE seemingly unimportant Quick Repair Washers may lead the way to a considerable saving of money both by keeping gears and pinions in mesh and thus saving wear and by eliminating shut-downs for extensive repairs.

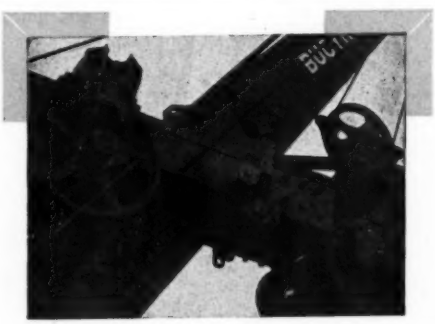
The first repair may save you the cost of a year's supply of Quick Repair Washers.

No need to dismantle machinery. Quick Repair Washers can be put on quickly and easily. They are securely fastened by tapping the overlatch in place.

When ordering give inside and outside diameters and thickness of washers required.

Bucyrus-Erie Company
Specialty Department
South Milwaukee, Wis.

BUCYRUS ERIE



INCREASED YARDAGE means more money in your pocket. One way to increase the output of your shovel is to install a Bucyrus-Erie Power Dipper Trip. Cut the time of *every* digging cycle. Save your operator's time and energy . . . his hands will work more profitably on the levers than on a trip rope.

We can supply a Power Dipper Trip for steam, Diesel, gasoline, gas+air and electric shovels. Try one on your shovel. It will pay for itself in a short time.

Bucyrus-Erie Power Dipper Trips give trouble-free service.

Mail the coupon—no obligation.

Please send complete information on dipper trip for..... type shovel.....powered.

Please send.....quick Repair washers.....inside dia.....outside dia.....thickness.

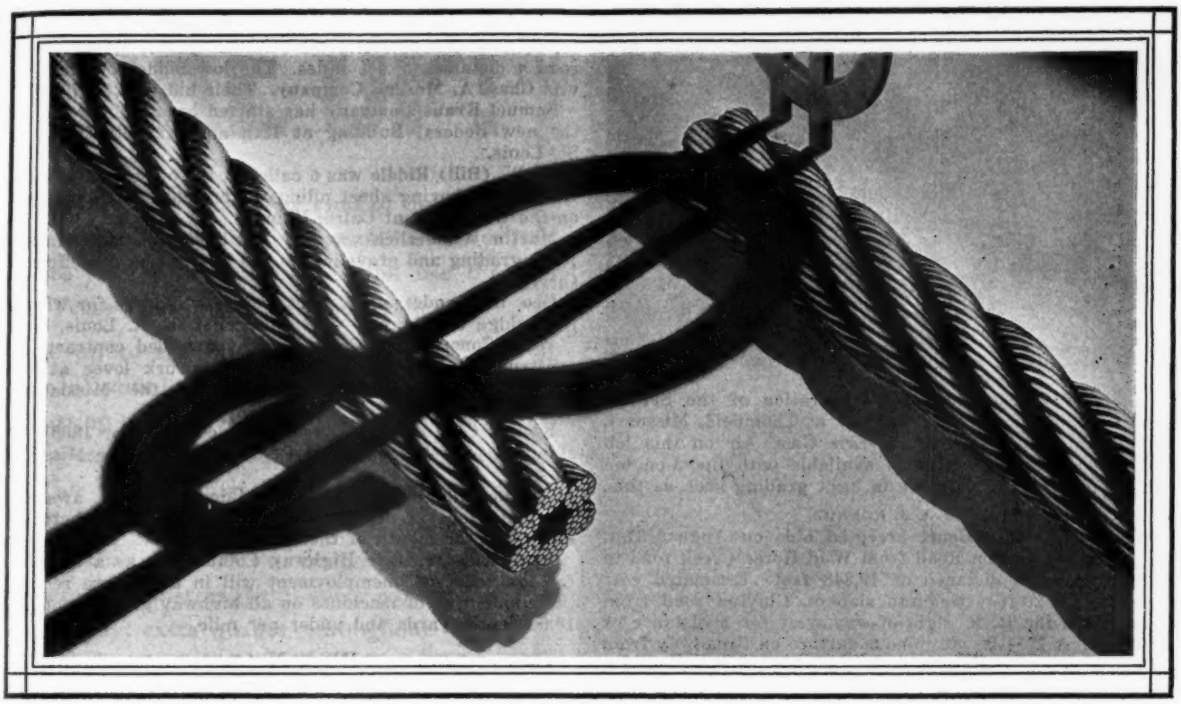
Name .....

Firm name .....

Address .....

Bucyrus-Erie Company,
Specialty Department,
South Milwaukee, Wis.

When writing to Bucyrus-Erie Company, please use coupon or card bound in this issue.



About the *Dollar* SIDE of Wire Rope service

When you buy wire rope you want a rope which will give you *safe* service. You also want a rope which, consistent with this safety, will insure *lowest* possible rope cost per ton of material handled or per other unit of work.

On this exacting basis, the use of Roebling Wire Rope will assure you of a maximum return in service for your rope dollar.

There are three principal reasons for this. First, because there is a Roebling Rope *exactly* suited to each wire rope need (see *"Wire Rope for all purposes"* at right). Secondly, because Roebling is free to make absolutely unbiased recommendations. Thirdly, because of the great stamina of Roebling Acid Steel Rope Wire.

We can confidently assert that when gauged by the work performed NO wire rope, regardless of make or construction, will show lower general-average operating costs than Roebling.

JOHN A. ROEBLING'S SONS COMPANY, TRENTON, N. J.

Wire · Wire Rope · Copper & Insulated Wires & Cables · Welding Wire · Flat Wire · Wire Cloth & Wire Netting

Atlanta Boston Chicago Cleveland Los Angeles New York Philadelphia Portland, Ore. San Francisco Seattle Export Dept., New York, N. Y.

A plain statement about Wire Rope Economy

Roebling does not indulge in nor encourage sweeping claims of superior wire rope economy. Such claims, if generally made, would merely confuse the rope user. ¶ For the guidance of rope buyers, however, Roebling does assert that when gauged by the work performed, NO wire rope, regardless of make or construction, will show lower general average operating costs than Roebling.

Wire Rope for all purposes

The importance of selecting the right rope for each use cannot be too strongly emphasized. For no one rope will meet all requirements. ¶ Roebling makes wire rope of a great variety of types and designs, including Standard Right, Left, Lang, Preformed and Alternate Lays, in all degrees of rope and strand flexibility. ¶ The great stamina of all Roebling Ropes is primarily due to the quality of Roebling Wire. This Acid Steel Wire is renowned for its fatigue resisting and wearing qualities. No better rope wire is produced. ¶ "BLUE CENTER" STEEL is the highest grade and is generally recommended for severe duty.

JOHN A. ROEBLING'S SONS COMPANY

For your convenience in writing to John A. Roebling's Sons Company you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

The above illustration shows operation of the **Service Construction Company** on highway at Thomfield, Missouri. They are using their Bucyrus-Erie Gas+Air on this job and find the accurate control available with the 3-engine operation especially valuable in light grading such as this.

By A. J. KOENIG

St. Louis County Court accepted bids on August 31st, for paving Eatherton Road from Wild Horse Creek road to Shepard road, a distance of 19,848 feet. Estimated cost $100,210. A 20-foot concrete slab on Clayton road from Missouri-Pacific R. R. right-of-way west for a distance of 1800 feet. A 17½-ft. bituminous surface on Broadway from Hoffmeister to the Barracks.

Engineers are now working on the **plans for elevating the Illinois Central tracks** in the vicinity of Lake Springfield at Springfield, Illinois.

Bids were received at Springfield, Illinois on Aug. 31 for a grade elimination at the foot of Collinsville Hill on routes 11 and 157.

Peter Simons has a contract for grading 5.41 miles of highway in Adams county, Illinois.

The Mississippi Valley Structural Steel Co., was awarded the contract for the superstructure of the Marseilles bridge across the Illinois River, at a price of $64,319. The contract for the substructure was awarded some time ago to **Congress Construction Company** on their bid of $47,100.

Of a total of $42,315,392 initial allotments for work on river and harbor improvements announced by the War Department, the Mississippi system comprising the Mississippi, the Missouri and the Illinois rivers, is allotted $15,017,000. For the Missouri $6,160,000; for the Mississippi $4,627,000; for the Illinois $4,193,000. The unallotted balance will be distributed when bids for contemplated work have been received and the amounts required definitely determined.

Bids for **two highway projects in St. Louis county** were received recently by the St. Louis County Court at Clayton. One project calls for the construction of culverts, grading and concrete paving of Woods Ave. for a distance of three miles. The low bidder was **Martin Wunderlich** with a bid of $97,955. The other project is the paving of Clarkson road a distance of 4¾ miles. The low bidder on this job was **Chas. A. Moreno Company.** Their bid was $127,000.

Samuel Kraus Company has started excavation work on the new Federal Building at 12th and Market streets in St. Louis.

W. W. (Bill) Riddle was a caller at the office in St. Louis. He is busy driving sheet piling for an addition to the wall on the Ohio river at Cairo, Illinois.

Martin Wunderlich was the low bidder on sixteen projects, grading and graveling, at the last letting at Jefferson City.

Geo. D. Prendergast & Sons were low bidders for widening bridge on highway 66 traffic relief in St. Louis.

Wills Construction Company was awarded contract for constructing 166,700 cu. yds. of earthwork levee at the Birds Point-New Madrid floodway on the Mississippi River.

Kansas City Bridge Company has contract for 1800 feet standard pile clump dike at Pelican Bend on the Missouri River.

Patton-Tulley Transportation Company was awarded contracts for six dikes on the Mississippi river between Cairo and the mouth of the White River.

The Missouri State Highway Commission as a measure for the relief of unemployment will in the future require the elimination of machines on all highway grading jobs of 10,000 cubic yards and under per mile.

River Notes

By C. F. BARTON

J. D. Burnett of Alexandria, Louisiana has been awarded three levee sections on the Red River in Louisiana totaling 800,000 yards. Mr. Burnett is using the above Bucyrus-Erie 45-B on this job working with a Northwest 1-yard dragline.

Old Timers!—See page 437

You don't know how economical

YELLOW STRAND

WIRE ROPE can really be until you try "Flex-Set" Preformed Yellow Strand on your excavating machinery. Made of tested, *selected* wire.

Get Catalog 51

BRODERICK & BASCOM ROPE CO.
ST. LOUIS
Seattle, Wash. San Francisco, Cal. Los Angeles, Cal.
Portland, Ore. Houston, Tex. New York, N. Y.
Factories: St. Louis and Seattle

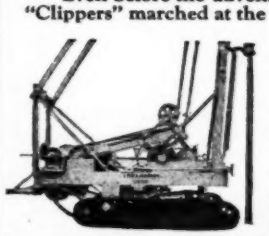
P-48

Loomis "Clipper" Blast Hole Drills

Loomis "Clippers" were in use long before a call was made for a blast hole drill. These "Clippers" were employed in mine ventilation work, quarry sink hole drilling, water well drilling, etc.

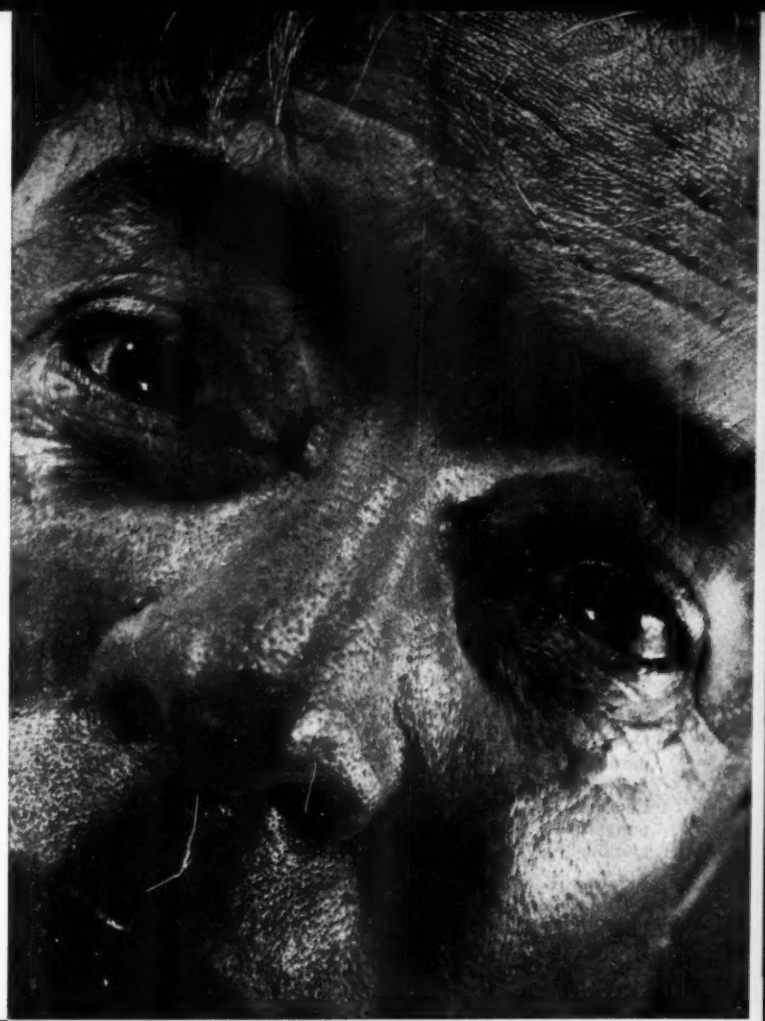
Even before the advent of high explosives Loomis "Clippers" marched at the head of the parade. Practically every improvement in well drill design has been first used as a Loomis feature.

Loomis "Clippers" predominate and are the most popular drills because they have earned the distinction.



The Loomis Machine Co.
K Street Tiffin, Ohio

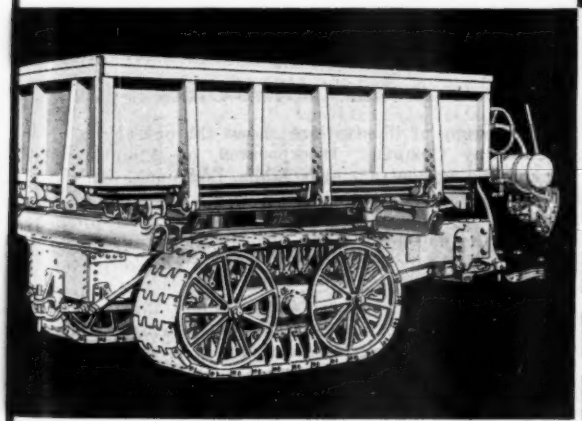
WAKE UP!



Left—right—rear! That's the kind of dumping that puts speed into your operations and savings into your pocketbook when you use the Athey Truss Wheel 3-Way Dump Trailer.

Wake up to the big Athey advantages of "baling in" your loads without careful spotting —of cutting out slow, wasteful bulldozing—of dumping exactly where you want to dump every time. Get the benefits of *lowest maintenance cost* assured by Athey principles of construction and Athey superiority of design. Remember that there's extra strength in every part of the Athey 3-Way, extra quality throughout—yet the 3-Way is *surprisingly low priced!*

It will pay you to get complete information about the Athey Truss Wheel 3-Way Dump Trailer before you invest in any other kind of dumping equipment. Write us today!



- A NEW "3-WAY"—STRONGER AND HEAVIER—GREATER SIMPLICITY
- SIDES AND ENDS OF ¼" STEEL PLATE—HEAVILY REINFORCED
- IMPROVED TYPE OPERATING MECHANISM—POSITIVE, DEPENDABLE CONTROL
- 37 OTHER NEW MECHANICAL REFINEMENTS AND IMPROVEMENTS
- 7-8 YARD UNIT EQUIPPED WITH 20-TON ATHEY TRUSS WHEELS
- NEW LOW PRICE—INCREASED QUALITY—IMPROVED DESIGN

ATHEY TRUSS WHEEL CO., CHICAGO, ILLINOIS

Dept. A, 130 North Wells Street **Cable Address: "Trusswheel" Chicago**

ATHEY

TRUSS WHEELS

Shots From the Firing Line — *Continued*

Frank Stanford was re-elected President of the Mississippi Valley Flood Control Branch of the Associated General Contractors at a meeting of the new Board of Directors at a meeting in Vicksburg, Mississippi August 3rd. Mr. Stanford was re-elected by acclamation while absent from the meeting. It was Mr. Stanford's wish that another be elected to head the Association, but the Directors were determined to draft him to receive the benefit to his zeal and energy for one more year.

D. G. Brown of Memphis and H. J. Sternberg of St. Louis were elected Vice-Presidents of the Association. Harry N. Rodgers was re-elected Secretary-Treasurer.

The **low bids** for 9,731,900 cubic yards of earthwork, for which proposals were opened by Major T. B. Larkin, U. S. District Engineer, at Vicksburg on August 4th follow:

5,161,900 cubic yards of new levee and enlargement at Worthington Point, about three miles south of Longwood, Mississippi to **H. B. Blanks** of Tallulah, Louisiana at 13.23 cents, with 450 calendar days for completion.

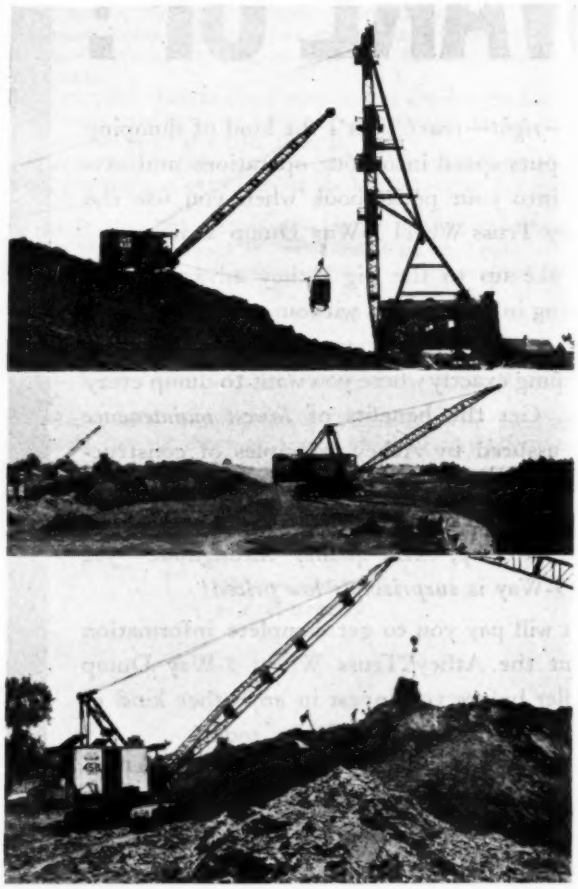
1,730,000 cubic yards of new levee, Cemetery Mound to Shipland, located about ten miles south of Mayersville, Mississippi to **Driver Construction Company** of Memphis at 12.20 cents, with 450 calendar days for completion.

1,485,000 cubic yards of new levee, above Delta to Reid-Bedford at Delta, Louisiana to **Fred M. Crane** of Omaha, Nebraska at 12.25 cents, with 450 calendar days for completion.

1,355,000 cubic yards of new levee, above Delta to Reid-Bedford, at Delta, Louisiana to **Driver Construction Company** of Memphis at 18.30 cents, with 100 days for completion.

James E. Seay of Batesville, Miss. was low bidder for 7,630 cubic yards of earthwork to repair a break in the Patterson Bayou Drainage District levee, located one mile northwest of Tippo, Miss., among the bids received at the U. S. Engineer District at Vicksburg on August 11th. Mr. Seay bid 19 cents per cubic yard. The Government estimate was 42 cents.

By W. W. WHORLEY



The above group of illustrations shows the operations of **Brooks-Callaway Company, Incorporated,** of Atlanta, on their levee building contract near Addis, Louisiana. On the Addis job and another job they have across the river near St. Gabriel, they moved approximately one-half million yards during the month of June. J. L. Brooks is in charge of operations at Addis and B. E. Brooks in charge of the work at St. Gabriel.

On the work at Addis shown in the upper illustration, they are operating a Bucyrus-Erie Tower Excavator which teams up with the 43-B gasoline dragline. There is a state highway at the foot of the new levee, making it necessary to place the head tower inside the levee section. For this reason the tower is unable to finish the back slope of the levee. However, it deposits the necessary material on top of the levee and the 43-B follows behind and finishes the section after the Tower Excavator moves forward. The dragline also assists by grading up the slope thus saving time for the larger machine.

On this same section Brooks-Callaway are working one of their Class 230 Bucyrus-Erie Diesel-electric draglines teamed with a Bucyrus-Erie 45-B Diesel dragline. The work of these two machines is shown in the lower pictures; the Class 230 with its 150 foot boom is placing the dirt in the levee section while the 45-B carries out and finishes the back slope.

On their section at St. Gabriel Brooks-Callaway have another Bucyrus-Erie Tower Excavator and another Bucyrus-Erie 43-B gas dragline.

Major B. B. Somervell, U. S. District Engineer at Memphis, has **recommended award of contracts** to the low bid-

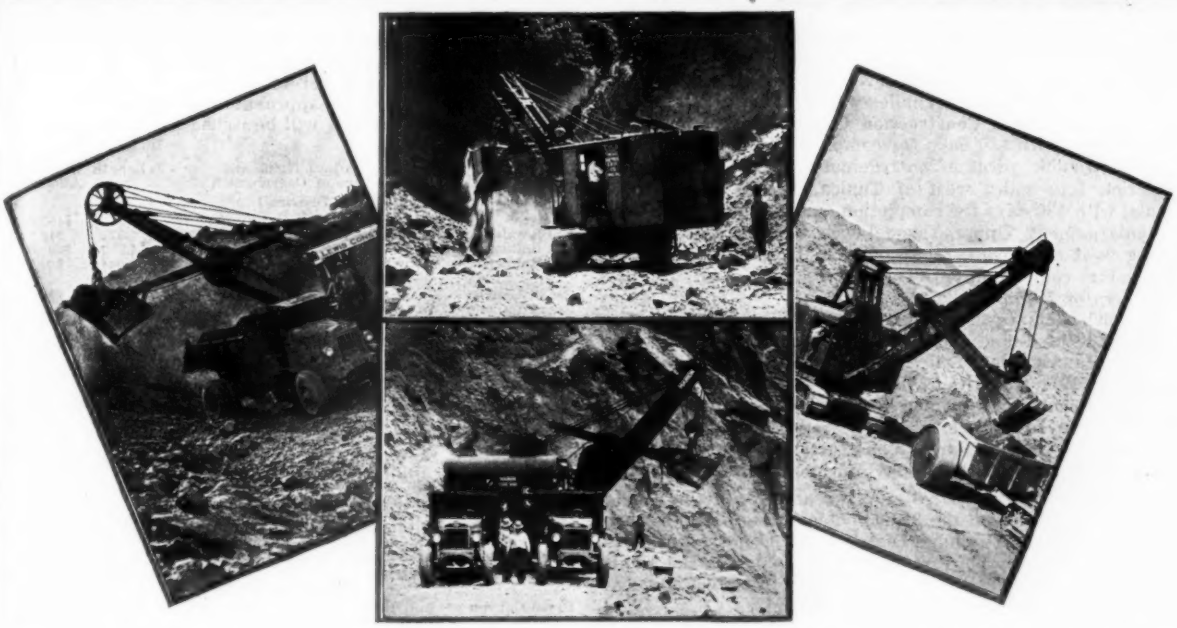
No Jacks Are Used on this Track Raising Job

Raising track is only one of the uses to which the Track Machine can be put. In addition to raising track vertically, it will also shift track laterally, from 18 to 36 inches being attained at a single shift. On waste dumps, on fills, in quarries and open pit mines, in fact wherever track must be raised and shifted and a track gang is maintained, this machine is a time and money saver. Why continue with old-time hand methods for which machinery is now available?

NORDBERG MFG. CO., Milwaukee, Wis.

THE NORDBERG PATENTED TRACK SHIFTER

For your convenience in writing to Nordberg Mfg. Co., you will find a card bound in this issue.



An Economical Wire Rope for Shovels

There are many reasons why "HERCULES" (Red-Strand) Wire Rope is an economical shovel rope, one of which is that it is the correct combination of strength, toughness, flexibility, elasticity and resistance to wear. No one quality has been overdeveloped at the expense of some other.

Construction is also an important factor, and "HERCULES" (Red-Strand) Wire Rope is furnished in a wide range of types and designs, and each is made according to our special methods of manufacture.

— And the same qualities that make "HERCULES" (Red-Strand) Wire Rope an economical shovel rope also make it a money saver on cranes, derricks, dredges, hoists, excavators and all other types of heavy duty material handling equipment. Why not give it a chance to show you what it can do? Measure its worth by its actual performance. Try it on your hardest work and keep a record of its relative cost "per unit of work done".

Made Only by **A. Leschen & Sons Rope Co.** Established 1857
5909 Kennerly Avenue
ST. LOUIS, MO.

New York - - - - 90 West Street
Chicago - 810 W. Washington Blvd.
Denver - - - - 1554 Wazee Street
San Francisco - 520 Fourth Street

1857 — SEVENTY-FIVE YEARS IN BUSINESS — 1932

For your convenience in writing to A. Leschen & Sons Rope Co. you will find a card bound in this issue.

Shots From the Firing Line — *Continued*

ders in the Memphis levee letting of August 2nd, as follows:

435,000 cubic yards of new levee and enlargement, Upper Yazoo Levee District, four miles west of Tunica, Mississippi to the **S. K. Jones Construction Company** of Memphis at 17.59 cents, with 130 days for completion.

365,000 cubic yards of enlargement, Upper Yazoo Levee District, four miles west of Tunica, Mississippi at 20.40 cents, with 130 days for completion, and 230,000 cubic yards of enlargement, Upper Yazoo Levee District, located four miles west of Stovall, Mississippi at 20.40 cents, with 130 days for completion to **Thomas F. Shea** and **Hughey Brothers** of Memphis.

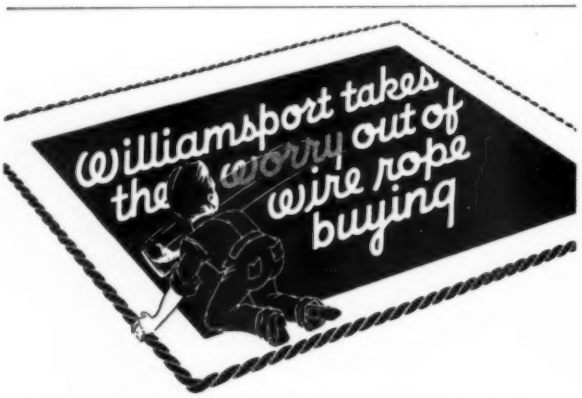
500,000 cubic yards of enlargement, White River Levee District, located nine miles south of Helena, Arkansas to the **Forcum-James Construction Company** of Dyersburg, Tennessee at 19 cents, with 130 days for completion.

550,000 cubic yards of new levee and enlargement, White River Levee District, located nine miles south of Helena, Arkansas to **Trinity Farms Construction Company** of Dallas at 19.49 cents, with 130 days for completion.

Batson Bros. of Dardanelle, Arkansas were low in a field of a dozen bidders on the 36,000 cubic yards of earth work in the Dardanelle Drainage District, Yell County, Arkansas which was recently bid through the Memphis District Engineers office. Batson Bros. bid was 11.9 cents. The government estimate for this work was 31.71 cents.

A group of Chinese boys were discussing the relative merits of the two bill boards, one advertising Carnation Milk and the other advertising Bull Durham.

One of the boys was explaining the signs to the other in this way: "In America they have he cows and she cows. The she cow gives the milk and the he cow gives the tobacco."



Users like to know these days what service to expect from the wire rope they use.

They don't like to be fooled with idle claims of superiority which are obviously ridiculous.

Williamsport wire rope is *good* rope, generally cheaper day in and day out than most ropes when measured by per mile of service.

We are glad to match the service of Williamsport ropes with any other, regardless of its name or make, and you'll generally find it greater economy to use Williamsport.

WILLIAMSPORT Wire Rope Company

Main Office & Works: WILLIAMSPORT, PENNSYLVANIA

General Sales Offices: Peoples Gas Building, Chicago.

California Notes

By H. L. LIVINGSTON

Plans and specifications are being prepared by the District offices of the U. S. Bureau of Public Roads, for the National Park Service only, on a list of projects involving a total estimated expenditure of approximately $1,756,000. It is expected that call for bids will be issued soon. The projects include:

Park	Project Name and Type of Construction	Length (mi.)	Tentative Allotment
	District 1		
Glacier	Transmountain Highway—Grading	5.578	$161,000.
Mt. Rainier	East Side Highway—Clearing	4.571	$12,000.
Mt. Rainier	East Side Highway—Grading	4.919	$200,000.
Mt. Rainier	West Side Highway—Clearing	2.944	$20,000.
	District 2		
Grand Canyon	South Approach Road—Seal Coat	35.139	$28,735.
Grand Canyon	So. Approach Road—Imp. & Maint.		$10,000.
Grand Canyon	South Approach Road—Bridges	0.293	$25,000.
Grand Canyon	Bright Angel Point—Cape Royal—Surf Betterments		$60,000.
Sequoia	Generals Highway—Improvement	10.585	$100,000.
Sequoia	Generals Highway—Grading	2.881	$200,000.
Yosemite	Wawona Road—Tunnel Vent & Paving		$177,000.
Yosemite	Wowona Road—Oiling & Maint.		$25,000.
	District 3		
Mesa Verde	North and South Highway—Oil Surfacing	20.367	$150,000.
Rocky Mountain	Fall River—Guardrail	29.865	$30,000.
Rocky Mountain	Fall River—Surfacing	29.865	$162,000.
Wind Cave	North and South Highway—Oil Surfacing	6.7	$10,000.
Yellowstone	Grand Canyon Rim Road—Oiling		$5,000.
Yellowstone	Grand Loop—Grading	1.0	$80,000.
Yellowstone	Grand Loop—Bridge	0.03	$37,000.
	District 12		
Bryce Canyon	Rim Road—Gravel and Surface	3.733	$55,000.
Zion	East Rim Road—Supple. Constr.	1.583	$158,400
Zion	Floor of Valley Road—Surf. & Oil	6.9	$50,000.

Constructors, Inc., 1304 Edwards Wildey Building, Los Angeles, who bid $11,270,043.00 on Proposition No. 1 (Gunite facing slab) and $11,215,868.00 on Proposition No. 2 (Concrete facing slab), submitted the only bid to the Los Angeles Flood Control District for the construction of San Gabriel Dam No. 1. The engineers' estimate on Proposition No. 1 was $9,734,380.00 and on Proposition No. 2, $9,691,040.00. The bid of the Constructors, Inc., has been rejected and a new call for bids will be issued in the very near future.

The members of Constructors, Inc., are a combination of the following: Bechtel-Kaiser Co., Utah Construction Co., J. F. Shea, Bent Brothers, Morrison-Knudsen Co., Winston Brothers Co., L. E. Dixon, and Paul Johnson Company.

Plans and specifications having been completed by the Chief Engineers for the **San Francisco-Oakland Bay Bridge**, bids will soon be called for the construction of the five West Piers. It is estimated that the cost of these piers will be $8,000,000.00. C. H. Purcell, who is the Chief Engineer of the California Highway Department, is Chief Engineer of the San Francisco Bay Bridge. Bids will also soon be issued for 21 East Bay Piers, the cost for which will be approximately $6,000,000.00. A tunnel will also be bored through Yerba Buena Island in connection with this work, which will be 500 feet long, 70 feet wide by 50 feet high inside of lining.

The Morgan Paving Company of Los Angeles has been awarded a contract in the amount of $255,248 by the California Division of Highways for grading and surfacing 10.2 miles of highway between Canyon Creek and Hat Creek Summit in Shasta County.

Fredrickson & Watson, Oakland, have been awarded the grading and concrete paving contract between Castro Hill and Stanton Avenue in Alameda County by the California Division of Highways. The amount of their bid was $109,313.

Old Timers!—See page 437

MEETING PLACE OF CAPITAL AND LABOR

THE KOENIG LABOR AGENCIES

Established 1875

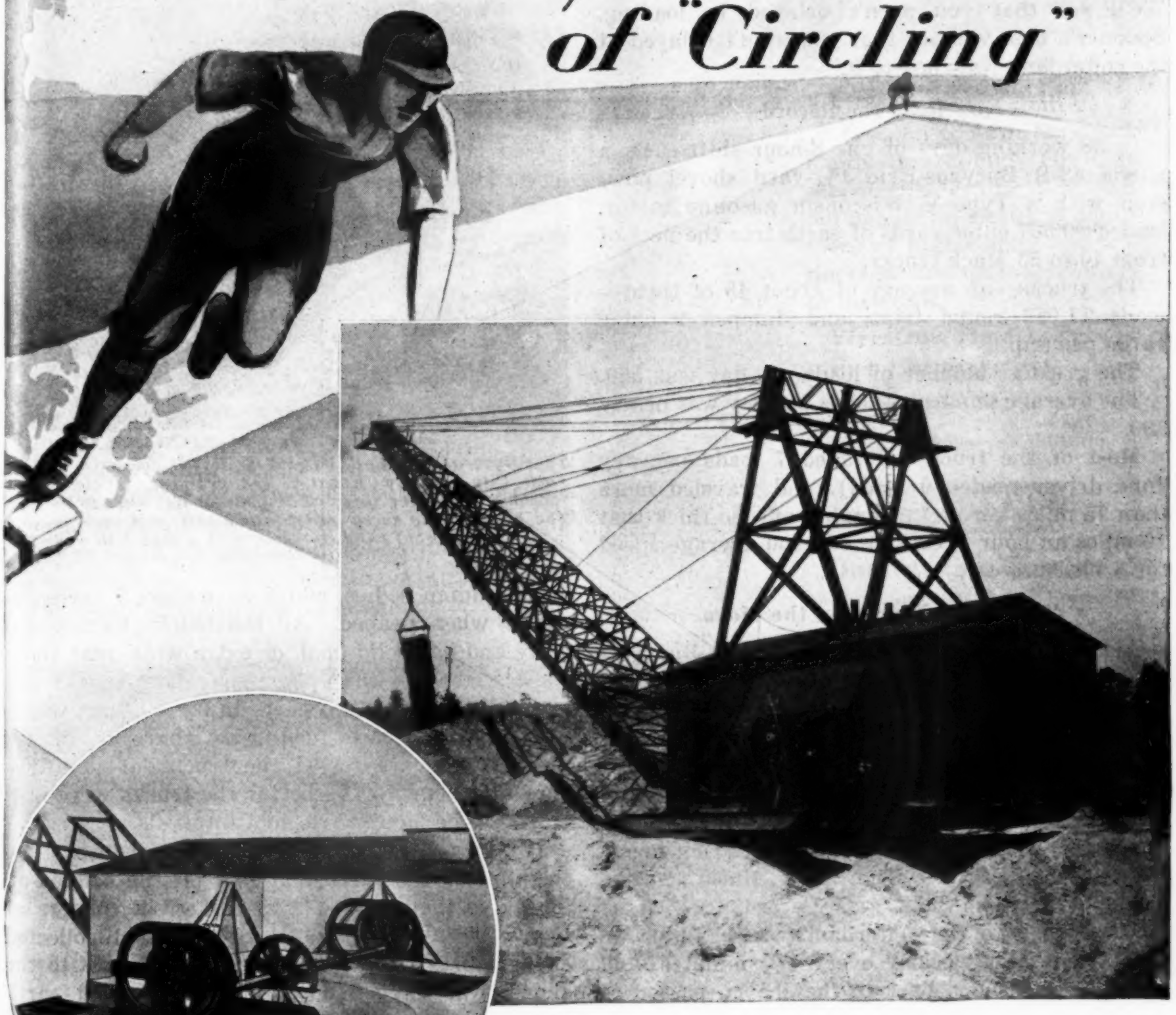
ST. LOUIS
612 Walnut Street
Main 2766 and 2767

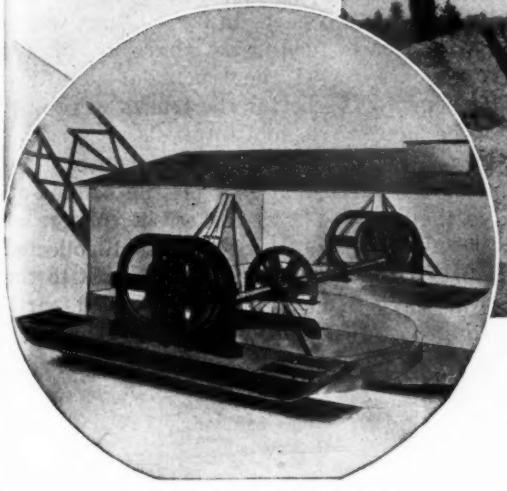
KANSAS CITY
501 Delaware Street
Main 0796

HELP OF ALL KINDS FURNISHED FREE

WINNERS . . . .

because they "Pivot" instead of "Circling"





BUCYRUS MONIGHAN

Walking Draglines 1 to 10 cubic yards

Sold by

BUCYRUS-ERIE CO.
South Milwaukee, Wis.

Representatives throughout the U.S.A. Branch Offices: Boston, New York, Philadelphia, Atlanta, Birmingham, Pittsburgh, Buffalo, Detroit, Chicago, St. Louis, Kansas City, Dallas, San Francisco. Offices or Distributors throughout the world.

LIKE the champion base runner who "gets places" by pivoting at the base instead of "circling" the Bucyrus-Monighan Walking Dragline avoids all lost motion in changing direction of travel.

There are no wide sweeps necessary in turning the Bucyrus-Monighan. The machine simply pivots on its circular base, with the walking shoes or treads raised clear of the ground. The only turning movement is the swinging of the revolving platform to point the machine in the desired direction. There is no straining or wracking of machine or treads.

This exclusive method of turning is one of the features which make it possible to operate the Bucyrus-Monighan on extremely soft ground.
Bucyrus-Monighan Company, Chicago, Ill. B-31

For your convenience in writing to Bucyrus-Erie Company, you will find a card bound in this issue.

Fast Trucking Through New York City Traffic

(Continued from Page 433)

They said to the truckdrivers, "Here's the shovel and there's the cofferdam. Take any route you want. Make the best time you can with safety. We'll see that you aren't delayed in loading. Spooner's men will see that you aren't delayed at the cofferdam. Now hop to it."

Now Read the Record

In 38 working days of one 8-hour shift each, a single 43-B Bucyrus-Erie 1¾-yard shovel powered with a Type E Wisconsin gasoline motor, loaded 99,567 cubic yards of earth into the fleet of from 40 to 53 Mack trucks.

The trucks—an average of about 45 of them—made 11,063 round trips, and dumped 9 cubic yards per trip.

The greatest number of loads per day was 560.

The average number of loads per day was nearly 300.

Most of the trucks averaged 7 loads per day (one driver made 10 loads), and traveled more than 75 miles per day through traffic so thick that 10 miles an hour is considered good average speed for a pleasure car.

43-B Keeps Trucks on the Move

Andrew Kovatch, the engineer on the Bucyrus-Erie 43-B, ably assisted by William Zehner, apprentice engineer, is justly proud of the way he kept those trucks on the move, despite the fact that he had plenty of 5-ton to 20-ton boulders to lift out of the way in his spare time.

The writer had occasion to park near the Long Island City approach of the Queensboro Bridge one day last May, and out of curiosity, timed the frequency with which the Ryan & Davis trucks passed on their way to the cofferdam. An earth laden truck came along nearly every 1½ minutes, and empty ones, headed back to the shovel, passed at the same time intervals. There were always two trucks in sight, and at no time were there more than three minutes between trucks going in the same direction.

Practically all of the Mack trucks on the job were equipped with Heil 8-yard (water level) hydraulic dump bodies, which gave them 9 yards capacity when heaped. All the trucks were chain drive and had solid dual, or extra wide, rear tires. As described in the June issue, these trucks ran across the cofferdam pockets on 24" I-beams which were laid flatwise to form grooved tracks. Planks in these grooves raised the trucks to clear the sprockets. Turning decks for the trucks were provided on the dam at frequent intervals.

This Bucyrus-Erie 43-B was the first 43-B delivered in New York City. Andrew Kovatch, the engineer, is clearing a "pebble" out of the way, while waiting for a truck to load. The trucks come every minute-and-a-half, and each takes 9 yards, but what's that to Andy with a shovel like this?

It was necessary to keep five men on the job cleaning up the earth that flew off the heaped-up trucks as they rounded various street corners at high speed. When the clean-up squad collected enough dirt, a truck which was bound back to the shovel was flagged down, and the spilled earth

On these streets, through traffic like this, Ryan and Davis' trucks hauled their heaping loads of dirt. Left: Looking south along Park Avenue from 59th Street. The New York Central and the New York, New Haven & Hartford railroad tracks run underground below Park Avenue. Center: Looking east along 59th Street from 5th Avenue. Right: Westbound traffic leaving Queensboro Bridge on Manhattan Island. One of the bridge towers shows in background.

was shoveled in to the truck to the accompaniment of horrible language by the delayed truckdriver.

The Ryan & Davis Background

Ryan & Davis ought to know something about moving dirt. Both members of the firm are experienced, old-time shovel operators. Both were employed by the U. S. Government as civilian experts in charge of the entire shovel equipment at the French ports of Bassen and Bordeaux during the World War. They know a shovel boom from a dipper handle, and no maybe about it.

When excavating for foundations for "Radio City" in New York, Ryan & Davis had their 43-B on the job.

George A. Gaines, their Chief Engineer, and former Captain in the U. S. A. Field Artillery, handled more than five million dollars worth of work for George W. Atwell Co. before he became associated with Ryan & Davis.

Taken all in all, this outfit knows the dirt moving business, but what is more important, all three of the men in it know how to handle men.

Stop Taking Chances

WHY risk loss from FIRE when you can have such handy protection? Fire-Gun acts quickly, can be used without danger on electrical equipment of high voltage and will not cause damage to machinery or materials.

Fire-Gun Fluid has practically no wetting effect.

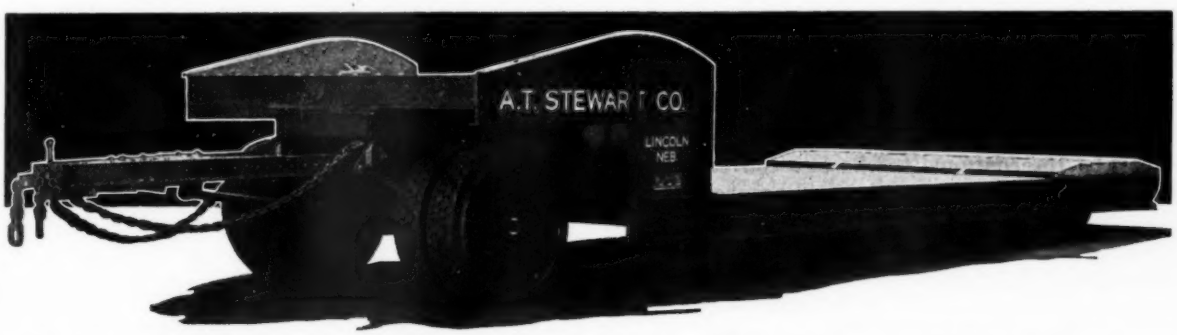
Keep a Fire-Gun handy.

Write for prices—no obligation.

BUCYRUS ERIE

Bucyrus-Erie Company

Specialty Department, South Milwaukee, Wis.



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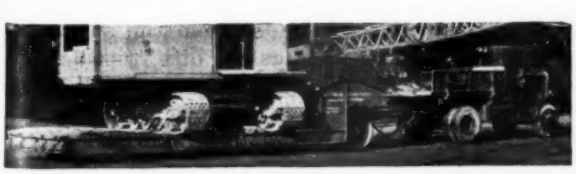
EXTRA STRENGTH WITHOUT INCREASED WEIGHT

Heavy equipment haulers prefer them because they have an abundance of extra capacity when needed for heavy overloads.



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Rear loading point is about six inches lower than on ordinary trailers. Shorter skids can be used, saving loading space; less time and labor is spent in blocking.. Your truck will pull a Williams "Arch-Girder" Trailer more easily because every wheel is equipped with big oversize Timken bearings — and more smoothly because rigid cast-steel, free-swiveling frames carry the rear wheels in pairs, assuring equal distribution of load when traveling over uneven roads . . . Write us for details and quotation on the proper size for your work.

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New Conditions Demand New Methods

(Continued from Page 431)

Numerous Advantages in New Drill Method

The principal saving possible with the new type drills is due to the greater advantages of the horizontal hole which concentrates the explosive where it will do the most good. One horizontal hole does the work that formerly required three vertical holes. There is no need to stop drilling to remove the cut material as the augur of the new Sullivan carries out the material as the bit goes in. The hole is naturally dry but if water should be encountered this drains freely through the level hole and therefore no explosive is wasted in cleaning the hole. As the explosive is loaded horizontally at the right level to give maximum results there is no need to spring the holes. The greater efficiency in location of the explosive makes a substantial saving in the quantity required. It is estimated that this will run about one-third. It other words, in this type of bank, loading horizontal holes requires only 66-2/3 percent of the explosive required to achieve the same results in vertical holes. A better breakage is also achieved. The experience at Enos so far has been that where formerly they broke 65 yards of overburden with a 12-pound cartridge of liquid oxygen they now break 100 yards with the same quantity of explosive.

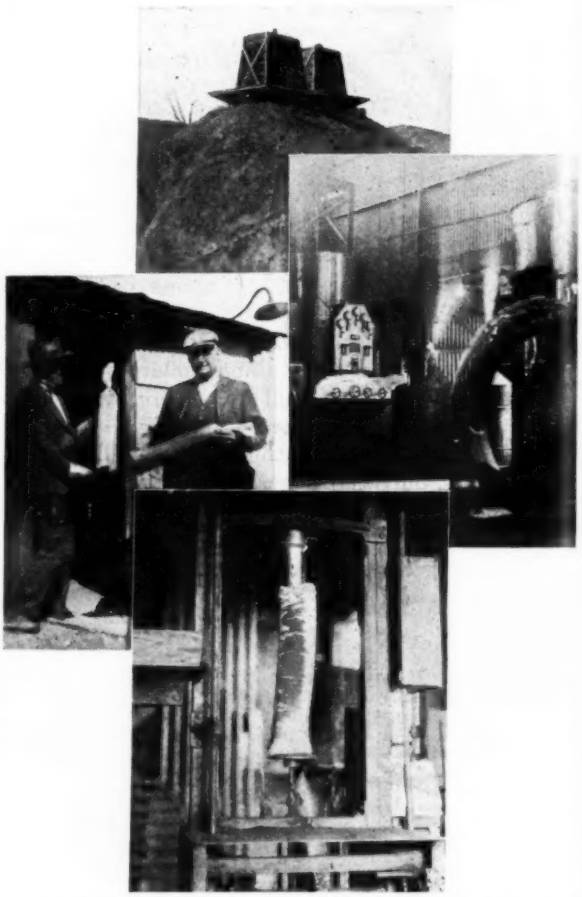
In changing the location of the drilling operations it was also necessary to change the method of hauling and loading the explosives. For the top holes the oxygen was hauled in the refrigerator boxes by International trucks to a conveniently located transfer station in the drilling area. Here it was transferred to platforms and then to wagons or sleighs. Teams hauled the boxes directly to the holes and the cartridges were dropped in.

Note steps and walk which extends completely around base; this safety measure makes it convenient to get on and off the machine at any time.

With the new horizontal holes worked from the pit floor, rail hauling is substituted for the trucking. A special miniature box car has been built with a capacity of two boxes. This is hauled from the liquid oxygen plant as near to the blast location as possible. There the box is rolled out to a special wagon (built from auto parts) and hauled by team to the holes. Cartridges are laid in the bore and rammed home by a wooden tamping stick with a jointed handle connected by specially designed copper hooks.

Hauling is over 36-inch gauge track with 6-yard cars, and steam dinkies. There are 197 cars, all hand dump and mostly Westerns. The dinkies total fifteen and are of various makes . . . Porter, Vulcan and American.

The average haul from pit to tipple and return for this year's operations is about 6 miles for the round trip. It is mostly over double track line with a maximum grade for loads of 9 percent in the pit and 2 percent either way on the main line.



At the liquid oxygen plant: top, water coolers; right, liquid oxygen pouring into Purox containers; left, cartridges ready to be soaked in oxygen; below, tamping carbon into canvas sack with packing machine.

Tractor and Bulldozer Find Many Uses Around Pits

An Allis-Chalmers Monarch 35 with Niess bulldozer is an invaluable handy man around the pit. It cleans up dirt slides, spill from the spoil pile, debris from the blasts, digs out dirt from depressions in the coal surface, throws track, hauls track material and dewatering equipment, grades the pit bank auto roads, and makes itself generally useful all over the place.

The water in the pits is handled by portable gasoline pumps. Water supply for liquid oxygen plant and shops is supplied by electrically driven Fairbanks-Morse pumps.

Tipple Turns Out High Quality Coal

Tipple output this season runs about 80 cars or 4000 to 4500 tons per eight-hour day. Under pressure the output can be considerably increased, the record run having been 105 cars totaling 5303 tons in an eight-hour shift. The present tipple crew is 40 men, twenty of these being engaged in picking over the coal to maintain the rigid standard for quality set by Enos.

The tipple is designed and equipped by Link-Belt and is well laid out to give maximum grading and picking facilities. Seven sizes can be graded at one time and thirty-four sizes can be selected by making use of various screen changes available. A second grade of coal is also manufactured for use in industrial plants, this being reclaimed from the rejects from the first grade and crushed. About 200 tons of this crushed coal is produced from 250 tons of gob, leaving only 50 tons to be returned to the pit for wasting in the cuts behind the coal loaders.

When the coal arrives from the pit the trains of narrow gauge cars are dumped by hand with a bar into a large hopper which feeds to a 125-foot conveyor that carries to the top of the plant. It works down from there through and over various screens and conveyors till, carefully cleaned and accurately sized, it reaches the proper gondolas waiting on the loading tracks below.

A Fairbanks-Morse scale with Streeter-Amet automatic registering device weighs all loaded cars as they are taken from the tipple. The scale and registering unit have been in use for eight years and have given very satisfactory service.

When the dipper comes up through the bank the movable counterweight comes down, applying its force with that of the power unit to the hoist drum.

The coal is hauled from the mine by the Algers Winslow & Western Railway, a short line railroad serving various mines in the vicinity and delivered to the Southern or Big Four at junctions about five miles away.

W. H. Nichol, is General Superintendent at Enos; Tom Allen is Assistant Superintendent; Charles R. Barnard is Chief Engineer; R. P. Hopkins is Office Manager; Lew King is Master Mechanic and H. P. Nichols is Tipple Foreman.

POSITIONS WANTED

Space under this heading is available at $5.50 per inch or fraction thereof.

Address all box numbers c/o The Excavating Engineer at South Milwaukee, Wisconsin

TRANSITMAN — OFFICE WORK

Experienced transitman with mining experience desires transit work, or will work as rodman, chainman or engineer's helper. Have also had experience as timekeeper, and much experience in safety work. Good references. Located Wisconsin, will go anywhere. Box 3513.

SHOVEL OPERATOR

Have 22 years' experience on general excavating and grading projects on gasoline, electric or steam powered machines. Can give best of references and can do own repair work. Will go anywhere. Present location Louisiana. Box 3605.

FOREMAN—ESTIMATOR—ENGINEER

15 years experience construction field as above. Age 34, married, war veteran, not afraid of hard work. Graduate University of Wisconsin College of Engineering. Will go anywhere. Excellent references. Available September 1st. Location, Illinois. Box 3703.

MINING ENGINEER

Mining Engineer, 34, married, fluent Spanish, desires position with responsible company. Experience — two years assistant engineer gold mine; three years foreman in large underground copper mine; six years foreman to mine superintendent open pit operating 25 electric shovels and draglines. Available immediately. Location, Maryland. Box 3801

DRAGLINE-CRANE-SHOVEL OPERATOR

Have had 15 years' experience on Diesel, electric and steam machines on levee and stripping operations. Will go anywhere. Married. A-1 references furnished. Can handle own repair work. Present location, Illinois. Box 3803

DRAGLINE-CLAMSHELL-SHOVEL OPERATOR

18 years' all around experience on highway, drainage and mine work. Will go anywhere. Can do own repair work. Reliable references. Present location, Florida. Box 3802

DRAGLINE-CRANE-SHOVEL OPERATOR

Over 15 years' experience on gasoline and Diesel machines, large and small in quarries; on steel work; gravel pits and highway work. Willing to go anywhere on any size machine. Can do own repair work and can furnish excellent references. Married. Present location Illinois. Box 3601.

SHOVEL OPERATOR

15 years' experience on electric, Gas+Air and steam machines on basement excavating; highway and railroad grading. Will go anywhere in U.S.A. Married. Age 35. A-1 references. Can do own repairing. Present location Pennsylvania. Box 3604.

SHOVEL OPERATOR

Fully experienced on general types of excavating. Have operated Erie, Osgood, Lorain and Northwest gasoline and steam machines. Willing to work one month without pay as demonstration. If employer is satisfied he may pay me. Have full set of own tools and can do own repair work. Willing to go anywhere. Can come on twenty-four hours notice. Single. Reliable references furnished. Present location, West Virginia. Box 3702.

CLAMSHELL-CRANE-SHOVEL OPERATOR

Experienced on Gas+Air and steam machines on general construction work. Willing to operate anywhere in U.S.A. Married. Can handle own repairing. A-1 references furnished. Present location North Carolina. Box 3602.

CONSTRUCTION AND MAINTENANCE ENGINEER

Over 25 years' experience on all types of shovel, cranes, locomotives on general construction work. Capable of taking full charge of crew. At present located in Australia. Available for work in New Zealand, China or Federated Malay States. Can furnish excellent recommendations. Address replies to W. J. A., 22 Ruthven Street, Waverly, N. S. Wales, Australia.

BOOK REVIEWS

A new pictorial bulletin has just been issued by Bucyrus-Erie Company describing and illustrating many uses of the Loadmaster, handy utility crane. Any reader interested in material handling problems may obtain a copy by addressing **Bucyrus-Erie Company, Department L-30, South Milwaukee, Wis.**, and mentioning this magazine.

The Allis-Chalmers Manufacturing Company, Tractor Division, Milwaukee, Wisconsin, has issued a series of folders on its line of elevating and blade graders. "More Yardage with the Allis-Chalmers Elevating Grader" is the title of a folder describing the 48-inch model.

The Allis-Chalmers Motor Patrol Grader is featured in a folder describing the construction and performance of this equipment. Folders describing the Allis-Chalmers No. 10 Leaning Wheel Blade Grader and the Allis-Chalmers No. 11 and 14 Leaning Frame Power Controlled Graders are also available.

John A. Roebling's Sons Company, Trenton, N. J., has published a 36-page booklet entitled **"The Splicing of Wire Rope,"** the primary object of which is to present a description of the methods of splicing wire rope employed in the shops of the Company. The booklet is profusely illustrated with photographs and diagrams and will be of service to any interested reader. Copies may be had free upon request.

Lukenweld, Inc., Coatesville, Pa., has published a 24-page booklet on the gas-cutting, press-forming and arc welding method of manufacturing parts for machinery and equipment. The benefits of the welding method of manufacture, to both builder and user of machinery and equipment, are outlined in the text of the bulletin, which may be obtained free upon request to the manufacturer.

Positive Dust Collection at Low Cost is the title of a catalog recently published by **Blaw-Knox Company, Blawnox, Pa.** Its 16 pages contain illustrations, diagrams and tables which will be of value to any reader interested in this equipment.

International Trucks for Contractors, Excavators and Road Builders is the title of a 32-page illustrated catalog published by **International Harvester Company of America, 606 South Michigan Avenue, Chicago.**

FOR SALE

Space under this heading is available at the following rates, payable in advance of publication:

1 to 3 inches.....$5.50 an inch net
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An inch is measured vertically on one column—three columns to a page. Any space may be used measured by the even inch in height and by one, two or three columns in width.

The price per inch is based on total space used—multiply ad. space by number of continuous insertions.

Address all box numbers c/o The Excavating Engineer at South Milwaukee, Wisconsin

Small Shovels
Under 2 Yards

ERIE TYPE "GA-2" GAS+AIR SHOVEL, shop number 4117, mounted on spur gear drive caterpillar trucks, and equipped with a 24-foot boom; 18-foot, 4-inch dipper handle; 1-cubic-yard manganese cast front socket inserted tooth dipper; power boom hoist; air self-starter, and all equipment and appurtenances in accordance with the specifications of the Bucyrus-Erie Company, f.o.b. cars shipping point Virginia. Box 126-SS.

USED BUCYRUS 30-B DIESEL SHOVEL— 25'9" Boom, 14' Dipper Handle, including Dragline Equipment. Box 251-SS.

ERIE REBUILT B-2 standard steam shovel, power boom hoist, new style "Cats." Factory guaranteed. Box 252-SS.

ERIE TYPE-B high lift steam shovel rebuilt July 1931 including new boiler. Since used 4 months. Excellent condition. Will rent. Box 286-SS.

REBUILT GA-2 ERIE SHOVEL mounted on new single shaft caterpillar, 1¼-cubic-yard inserted tooth dipper, 22-foot 6-inch boom, 16-foot dipper handle, starter. Carries guarantee of new machine. Box 43-SS.

NORTHWEST SHOVEL, model 105, caterpillar mounted, 24-foot boom, 1-cubic-yard dipper, 16-foot dipper handle. In good condition. Price $4,500, f. o. b. Utica, New York. Box 34-SS.

OSGOOD GASOLINE ONE-CUBIC-YARD COMBINATION SHOVEL-CLAMSHELL-DRAGLINE. Six cylinder Beaver motor. Overhauled late 1931. Bargain price. Box 323-SS.

UNIT MODEL B three-quarter swing, ⅝-cubic-yard Shovel. New 1928. Excellent Condition. Box 350-SS.

BUCYRUS-ERIE USED 20-B gasoline shovel. Good condition. Box 353-SS.

BUCYRUS-ERIE 32-B gas shovel, slightly used. Bargain. Will rent. Box 341-SS.

BUCYRUS-ERIE TYPE GA-2, EXTRA HIGH LIFT, GAS+AIR SHOVEL, shop number 10509, steel cab, mounted on single shaft drive caterpillars, equipped with 24-foot boom, 18-foot dipper handle, one-cubic-yard dipper. Located in Central Michigan. A real bargain at $4800.00. Box 333-SS.

BUCYRUS-ERIE 41-B steam. 50-foot boom. Specially arranged for pile driving service. Will rent. Box 342-SS.

ERIE GAS+AIR Combination high lift shovel and dragline equipment. Chain drive. "Cats." Very good condition. Located vicinity Chicago. Box 337-SS.

ERIE TYPE B-2 STANDARD STEAM SHOVEL, "Cat" mounted. Located near New York City. Will rent. Box 317-SS.

USED TYPE "O" THEW STEAM SHOVEL, shop number about 2100; 20' boom, 16' dipper handle, ¾-yd. dipper. Good running condition. Located Milwaukee vicinity. Bargain. Box 261-SS.

LIMA 101, 1¼-CUBIC-YARD GASOLINE ROPE CROWD SHOVEL. Electric starter and lights. Shipped from factory late 1930. Excellent condition. Will rent. Box 322-SS.

MARION MODEL 36 STEAM STRIPPING SHOVEL, shop number about 4100, 30-foot boom, 18-foot 6-inch dipper handle, 2-cubic-yard dipper, caterpillar mounted. Located near Isabel, South Dakota. Approximately $2000.00 worth of spare parts included. Immediately available. Priced to sell. Box 233-SS.

P&H MODEL 204. Shop number above 2200, combination Shovel Clamshell. 19' shovel boom, 14'6" dipper handles, ½ cubic yard dipper, 35' clamshell boom, ½ cubic yard Owens Type M digger type bucket. Both front end equipments less than one year old. Excellent condition. Box 254-SS.

BARGAIN

Erie Type B number 208, ¾-yard steam shovel on caterpillar mounting with dragline attachment. Ideal for Construction work or Placer mining. Good condition, located Colorado Springs, Colo. Price right. Box 362-SS.

LORAIN 55 Gasoline one cu-yd. Shovel, new April 1929. Excellent condition. Box 270-SS.

THREE TYPE A BUCYRUS-ERIE STEAM SHOVELS. Good value. $500 each.

FOUR TYPE B BUCYRUS-ERIE STEAM SHOVELS. Good operating condition. $1000 each. Box 328-SS.

ERIE TYPE B-2 high lift steam shovel, "Cat" mounted. Good operating condition. Will rent. Priced to sell. Box 286-SS.

TYPE B-2 STEAM SHOVEL, number 9830, mounted on single shaft caterpillar-type mounting. Equipped with 21-foot 3-inch boom, 16-foot dipper handle, ⅞-cubic-yard inserted tooth dipper. Boom hoist and Mass. standard boiler. Located vicinity of Boston. Reasonably priced. Box 345-SS.

BUCYRUS-ERIE brand new 1035 gasoline shovel, rope or chain crowd. Also clamshell or dragline equipment. At price you cannot refuse to consider. Box 356-SS.

BUCYRUS 20-B steam shovel ¾-yd. Dipper. $1,500.00 Chicago territory. Box 348-SS.

LIMA 101 1¼-CUBIC-YARD GASOLINE SHOVEL. Electric starter. New May, 1931. Good condition. Will demonstrate—will rent. Box 358-SS.

TYPE "B" ERIE STEAM SHOVEL, caterpillar mounted, 19-foot 9-inch boom, 16-foot dipper handle, ¾-yard dipper, boom hoist. New 1924. Excellent condition; new flues in boiler. Located near Chicago. Priced to sell. Box 157-SS.

BUCYRUS-ERIE SLIGHTLY USED — Factory guaranteed 1¼-cubic-yard High Lift friction gasoline shovel. Box 354-SS.

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- ☐ B-E 32-B Gas Drgln. 45-ft. boom. Like new.
- ☐ Lorain 55 1-yd. Shovel. A-1 condition.
- ☐ B-E 41-B steam 50-ft. boom special for pile driving.
- ☐ Monighan Dragline 60-ft. boom. Priced right.

Name .....

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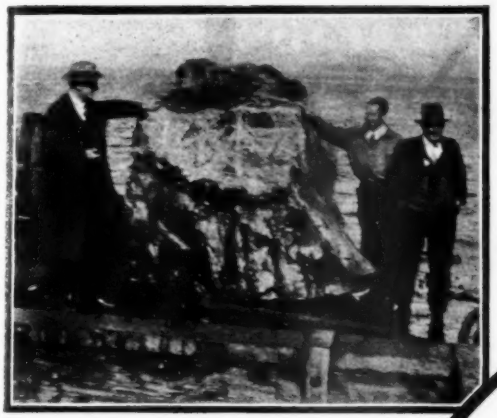

SELDOM are clamshell buckets called upon to handle such heavy rock as shown here where Siems-Helmers, Inc. of St. Paul, Minn. are using Blaw-Knox Heavy Duty Dredging Buckets to handle blasted rock from San Francisco bay. The large piece shown at left approximates 6 cubic yards. Blaw-Knox Buckets are built to meet the service demanded, from the lightest rehandling to heavy excavating and are equipped with ball bearing sheaves to prolong life and resist wear. May we send you a catalog? Just use the coupon below.

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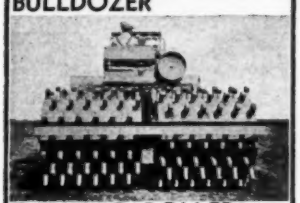

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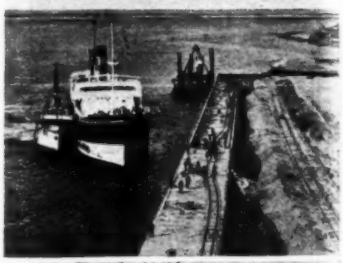

Canada's Northernmost Seaport

Above: Twin Bucyrus-Erie dipper dredges hibernate under a blanket of snow through the winter months. Left: Grain elevator, looking south. The hopper barge receives another installment of its "soupy" cargo. Center: General map showing route of Hudson Bay Railway. Right: The S. S. Farnworth arrives to take the first cargo of grain. The digging end of a dredge silhouetted against the northern sky. Below: General view of Churchill Harbor, looking south.